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The Agrarian

OFFICIAL STUDENT PUBLICATION

CLEMSON, S. C. THE CLEMSON A & M COLLEGE NOVEMBER 1957

VOLUME XVII NUMBER 1

PERMIT NO. 4 — CLEMSON, S. C.
BULK RATE — U. S. POSTAGE PAID

Lend to me Your winds.

Let them stir
This laggard heart of mine,
Give life to this
My torpid gratitude
And bear it heavenward.

Permit each rustling leaf,
Each air-borne spray,
Each silken murmur
Of the winnowed grass
To be my fervent prayer
Of thanks.

Lend the lightning to me.

Allow it, if You will,
To rend this vaulted soul,
To shatter every selfish thought,
And wither with its heat
Each growing weed
Of petulance.

Command its glowing point
To touch and aggravate to flame
The smouldering kindling
Of my gratefulness.

Let me borrow of the thunder.

Let me steal its strength
And let its rolling loudness
Add volume to the smallness
Of my voice.

From it, let me draw
The courage to withstand
The tempting comforts
Of my passiveness,
And wake me to acute awareness
Of my dependency on You.

And of Your rain and snow
Let me partake.

Let them cleanse
This mind, this heart, this soul
Of the self-imprinted stains
Which are the telltale marks
Of gross conceit.

Permit them to refresh the memories
Of countless blessings,
Of mercies undeserved,
And rewards unmerited.

Put, for just one day,
Your elements within my hand
To magnify and swell
My small and soundless
"Thanks!"

Thanksgiving, 1957

JOHN DEERE
MOLINE, ILLINOIS

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THE AGRARIAN

Volume XVII The Clemson Agricultural College Number 1

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AGRARIAN PHILOSOPHY

Should you join that club? There's no foolproof answer to that question—it depends on the student himself. Every college student should participate in a certain amount of extra curricular activities, but the time that each student should allot to these activities will, of course, depend on his amount of free time.

Before I enrolled at Clemson my father half-jokingly offered this advice: "Don't let your studies interfere with your college education." While this may seem absurb, it contains sound meaning. A college education consists of more than just mere "book learning." One of the most important benefits that can be derived from a college education is learning how to get along with people, and a good way to accomplish this is by working with fellow students in various extra curricular activities. However, one should always bear in mind that the neglect of study in favor of other activities is no better than the excessive study that characterizes the bookworm.

There are eleven student organizations in the School of Agriculture, all of which are featured in directory form in this issue. Every Agriculture student should be a member of at least one of these organizations. First on the "join" list is the student's departmental club. Many students make the mistake of waiting to affiliate with their departmental club until their junior or senior year. These same students will readily admit that they would have joined sooner had they known what their departmental club meant to them.

A final point for club members to remember is this: Club membership in itself is not enough—it's the participation in club activities that benefits you and your fellow students.

—G. E. S.

THE COVER: Shows the least looked-at Thanksgiving turkey ever to make the magazine cover of a magazine. The reason is obvious — our photographer caught Miss Diane Austin in a pose that is definitely not "for the birds." Diane is a Clemson coed and a native of Atlanta, Ga.

(Photo by Adams)

A Great Experience ---
The Danforth Fellowship

By Lanny Moore, Dairy '58

On the twenty-eighth of July, I left Fort Benning, Ga., for what was to turn out to be the best four weeks of my life. The occasion was the Danforth Fellowship, offered each year to an outstanding rising senior majoring in agriculture. There is one delegate selected to represent each state, and I was chosen to represent South Carolina and Clemson.

I arrived in St. Louis, Missouri, by plane on Sunday afternoon, July 28. It was a beautiful sunny day. As a matter of fact, the weather was perfect for the entire four weeks. I went from the airport to Washington University, where I resided for the next two weeks with the exception of two nights at the Purina Research Farm. Here I started meeting some of the boys whom I would be with for the remainder of the fellowship. My roommate was Leonard Sip from South Dakota.

On Monday morning we boarded a bus for the Purina research farm and met Mr. Earl Sindecuse, who was our host for the occasion. We spent three days at the farm, where we learned many things about research and saw some fine animals and modern equipment. They have an excellent sanitation program, which is essential to good research. We also had the pleasure of hearing some outstanding men speak about planning the research programs and how they are carried out. This three-day visit was a very practical tour, and we all learned many new aspects about farming that we would take home. One of the highlights of our visit was a softball game in which we played the farmhands. They really walloped us, but after all, they have been playing together for some time. We returned to St. Louis and Washington University on Wednesday night.

Thursday morning at 7:00 a.m., we boarded a street car and went to "work" at the Ralston Purina Company. We learned what it was like to be a "City Slicker" and believe me, 'It Ain't No Fun." We spent one hour each morning and one hour each evening riding on the street cars. The next 10 days we were in and out of Purina's St. Louis office. During this time we had courses in nutrition, research, management, and many other facets of the farming business. We worked a lot together and had many classes, but it wasn't all work and no play. We had many a good time, such as seeing ball games, shows, etc. One highlight was the way "Sindy" (Mr. Sindecuse) always kept guessing. We never knew what we were going to do from one minute to the next, and we were always in suspense.

Clemson's three representatives to Camp Miniwanca last summer were (left to right) Lanny Moore, Dr. L. D. Malphrus, and Michael Mangum.

I might add here, that when I refer to **we** all through this article I am referring to the 36 of us who made up the fellowship. There were 33 states represented, plus Puerto Rico, Hawaii, and Canada. They were a great bunch of fellows that I shall always remember.

On August 11th we boarded a train for Chicago, on our way to Camp Miniwanca on the shores of Lake Michigan. We spent about nine hours in Chicago touring the "Windy City" and then boarded another train for Milwaukee. Before we knew it we were walking up the gang plank to the deck of the Milwaukee Clipper, a boat which ferried us across Lake Michigan. We were cordially greeted at the camp, and activities started immediately.

Camp Miniwanca is a leadership camp sponsored by the American Youth Foundation, of which Mr. William H. Danforth was one of the founders. The camp is different from any other camp I had ever attended or heard about. We learned about and practiced the "Four Fold Way of Life", which includes Religious, Mental, Physical, and Social educational living. The Camp has very outstanding leaders and a very competent staff of instructors to train the campers. There were approximately 500 boys there from the ages

(Continued on page 14)

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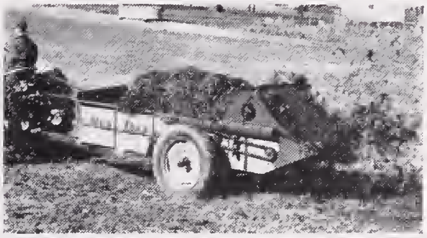

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EDITOR'S NOTE: John Parris, the author of this article, originated the idea for Rural Youngfolks Day and also served as its student chairman.

Highlight of Farm and Home Week . . .

Rural Youngfolks Day

By John Parris, V.A.E. '58

The highlight of the 1957 Farm and Home Week program was the initiation of South Carolina's first RURAL YOUNGFOLKS DAY, Tuesday, August 13, 1957. Hundreds of boys and girls from all areas of South Carolina and neighboring states were on hand for the opening assembly in the Clemson College Auditorium. Members of 4-H Clubs, F.F.A. and F.H.A. Chapters, Boy and Girl Scout groups, and others brought a record attendance for the opening day of Farm and Home Week.

The purpose of this special youth day was to give the boys and girls of the state a chance to see and learn about their state agricultural college, to see and study Farm and Home Week exhibits and other things of interest at Clemson, and to meet boys and girls from other communities than their own.

The opening assembly program began at 12 o'clock with Dr. J. W. Jones, Director of Agricultural Teaching, presiding. Dr. R. F. Poole, President of Clemson College, gave the welcoming address. Also, as a special feature of the day, and hour of entertainment with "Stutterin' Sam", widely known comedian, was presented.

The afternoon program included an address by Dr. J. W. Jones, Director of Agricultural Teaching, on "Careers in Agriculture." Immediately following Dr. Jones' address the group was divided into five smaller groups for the directed tour. Clemson students led the groups on a thorough tour of the agricultural facilities of the college. Members of the staff of the Agricultural Department were on hand at the seven major stops to give demonstrations and show the visitors around in their department.

The afternoon tour included visits to the Dairy Processing Laboratory where the actual demonstrations of milk pasteurizing and bottling, ice cream manufacturing, butter making, and cottage and blue cheese manufacturing were given by members of the Dairy Department staff.

Pictured here are the members of the student committee for the 1957 Rural Youngfolks Day Program. Seated left to right are: John Parris, Student Chairman; Larry Edwards, and Melvin Rogers.

The process of converting the live bird to a pan-ready fryer was shown in the Poultry Processing Laboratory.

Modern techniques in canning and preserving of foods were demonstrated by actual operation in the Horticultural Processing Laboratory.

Meat cutting, identification of cuts of meat, and carcass demonstrations were shown in the Animal Husbandry Processing Laboratory.

The visit to the Greenhouses proved interesting, largely because of the exhibition of tropical and desert plants.

The Agricultural Engineering Department gave electric motor demonstrations, and displayed numerous engineering principles used in agriculture.

Also, a visit to the Plant and Animal Science Building carried the people into the classrooms, the research and teaching laboratories, and the soil testing laboratories. Modern equipment used in teaching and research work was on display.

These and many other interesting sights were visited during the tour—all pointing to the advancements in the study of the science of agriculture. The tour concluded with a drawing for prizes which were furnished by the different agricultural departments. Clemson-made ice cream was served to all participants in the afternoon program.

Mr. J. B. Williams, State 4-H Club Agent, gave the following statement

(Continued on page 14)

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Directory of Clemson Student Agricultural Organizations

AGRICULTURAL ECONOMICS CLUB

The Agricultural Economics Club is a progressive organization that has as its primary purpose the creation and promotion of fellowship among Agricultural Economics majors. Other important purposes are to study current agricultural and economic problems, to obtain an understanding of the services agricultural economists can render, and to provide opportunities for better acquaintance among members and professional workers in the agricultural social sciences.

The officers for this year are:

Laurice F. Rhem, III, President; Norville B. Spearman, Vice President; Rhemar P. Lane, Secretary; Bobby J. Batten, Treasurer.

ALPHA TAU ALPHA

The Kappa Chapter of Alpha Tau Alpha is the National Professional Agricultural Education Fraternity at Clemson. The Kappa Chapter is open to those students who excel in Vocational Agriculture Education and show qualities of leadership and scholarship. The Kappa Chapter meets once a month at a time to be announced later. The meeting place is room 1, Student Center. The officers are as follows:

President, Adger Carroll; Vice-President, David Buckner; Secretary, States McCarter; Treasurer, Benny Friar.

The club advisor is Professor B. H. Stribling.

A. S. A. E.

The members of the American Society of Agricultural Engineering strive to promote student interest in Agricultural Engineering and to create an understanding and fellowship between the students and faculty. Club activities include banquets, field trips, the Agricultural Engineering Fair, and other projects.

To become a member of the A.S.A.E., a student must have passed at least fifteen credits including remedial work and must be majoring in Agricultural Engineering. Regular meetings are held on first and third Tuesdays at 6:30 p.m., either in the Agricultural Engineering Auditorium or the student center as announced.

This year's slate of officers is:

Roy H. Herron, President; Henry L. Young, Vice President; Jerry A. Smoak, Secretary; Edmund M. Redman, Treasurer; James K. Merck, Reporter; George Hardy, Coordinator.

Professor J. A. Murphy is the faculty advisor.

ALPHA ZETA

Alpha Zeta is a national honorary agricultural fraternity. The South Carolina Chapter was chartered at Clemson in 1930. This local chapter of Alpha Zeta served as the coordinating organization for the Agricultural Fairs at Clemson in 1953 and 1955. Alpha Zeta also sponsors THE AGRARIAN.

The objectives of Alpha Zeta are to foster high standards of scholarship, character, leadership, and a spirit of fellowship among all its members, and to promote the profession of agriculture. The fraternity meets on the second and fourth Mondays of every month at 6:30 p.m. in the student center. New members are invited on the basis of their scholarship, leadership, and character.

The officers for the current school year are:

Gene Stembridge, Chancellor; Robert L. Stephens. Censor; George W. Powell, Scribe; Bryan Richey, Treasurer; Michael Bosnak, Chronicler.

The chairman of the faculty advisory committee is Dr. L. D. Malphrus.

BLOCK AND BRIDLE

The Block and Bridle Club promotes greater interest in livestock and a closer relationship between Clemson Students and faculty members interested in livestock.

The club meets on the second and fourth Tuesday night of each month at 6:15 in 123 Long Hall. Each year the club has a barbecue for IPTAY members at the Spring Intra-Squad Football Game. This year the club is planning a continuation of the successful Clemson Little International, which was held last year for the first time. Each year the club sends delegates to the National Convention and the International Livestock Exposition. This is a great experience for the delegates chosen to represent Clemson.

The present officers of the club are:

William Weeks, President; Frank Way, Vice President; J. E. Younce, Secretary; Ted Hayes, Treasurer; P. C. Cochran, Student Placement Officer; T. S. Baker, Marshal; Rufus Sherard, Program Chairman; and Todd Arant, Publicity Chairman.

DAIRY CLUB

The purpose of the Dairy Club is to bring together students mutually interested in topics relative to the dairy industry and to inspire a livelier interest in academic work. Membership is open to all agriculture students who are interested in the dairy industry.

The Dairy Club meets on the second and fourth Tuesday night of each month at 6:15 p.m. in the student center.

The officers for this year are:

G. W. Powell, President; Ken J. Locher, Vice President; James A. Trammel, Secretary-Treasurer.

FORESTRY CLUB

A new forestry club has been organized at Clemson. The membership of this club, which for the present will be called the Clemson College Forestry Club, includes all students majoring in forestry, extension foresters, research foresters, and faculty members.

The purpose of the organization is to bring about a closer relationship between the forestry students and

(Continued on page 14)

BETWEEN T

Sowed by SAN

ALPHA ZETA INITIATES NEW MEMBERS

The South Carolina Chapter of the national Fraternity of Alpha Zeta received 14 students to its membership on October 14. These students were elected to membership on the basis of their scholarship, character, and leadership. Alpha Zeta is the honorary agricultural fraternity at Clemson.

Initiates are: First row, (left to right) James Blackwell, Bruce Bates, Rufus Sherard, Buddy Bond, Billy Ray Abercrombie, Arthur Klinger; Second row, Bruce Byrd, Allan Inglesby, John Williams, Richard Holstein, III; Third row, Guy Sabin, James Trammel, Robert Gooding, and James Beason.

NEW PROMOTIONS AND APPOINTMENTS

Dr. J. W. Jones, Director of Agricultural Teaching recently released several appointments and promotions for faculty members in the School of Agriculture.

In the Agronomy Department, Dr. C. M. Jones has been promoted from Associate Professor of Agronomy to Professor of Agronomy, and Dr. G. R. Craddock was promoted from Assistant Professor of Agronomy and Assistant Soil Scientist to Associate Professor of Agronomy and Associate Soil Scientist. Dr. K. F. Moore is now an Assistant Professor of Agronomy. He is featured in this issue's "Men Who Guide Us."

Dr. R .W. Rutledge, a former Associate Professor of Botany has been promoted to Professor of Botany.

Mr. B. E. Goodale, a professor of Dairying, was promoted to Head of the Dairy Department, and Dairy Husbandman; also in the Dairy Department, Dr. D. M. Graham was promoted from Assistant Professor of Dairying to Associate Professor of Dairying. Dr. Graham is also an Associate Dairy Husbandman.

The Entomology and Zoology Department has five new members on its staff. These new members are: Mr. T. R. Adkins, Assistant Professor of Entomology and Assistant Entomologist; Dr. E. W. King, Jr., Assistant Professor of Entomology, Assistant Professor of Zoology, and Assistant Entomologist; Mr. H. P. Blocker, Graduate Teaching Assistant; Mr. W. C. McGraw, Graduate Teaching Assistant; and Mr. S. G. Turnipseed, Graduate Teaching Assistant.

MILTON D. FARRAR CHOSEN AS CHAIRMAN OF STATE AGRICULTURAL COUNCIL

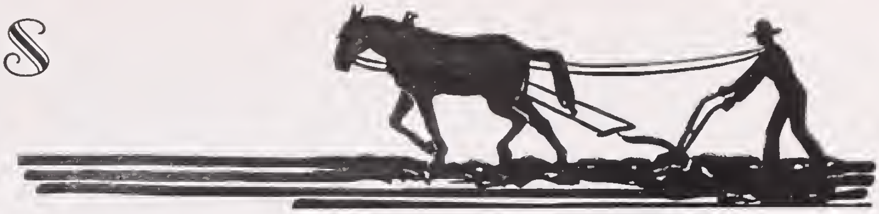
At a meeting of the State Agricultural Council held October 3 at Columbia, S. C., Milton D. Farrar was chosen as its Chairman for the coming year. Dr. Farrar is Dean of Agriculture here, and is well known as a man with a keen interest in the welfare of South Carolina's agricultural population.

His interest in the progress of agriculture has led him to participate in varied facets of public relations work concerning agriculture. Since one of his major interests is entomology, he is particularly active with problems concerning insect damage to agriculture and how to control such damage. He served as head of Clemson's Department of Entomology and Zoology before becoming Dean of Agriculture.

The State Agricultural Council is composed of a group of men who are interested in serving to further the progress of agriculture in South Carolina. There are representatives on the committee from all major agricultural agencies in the state. Meetings give an opportunity to discuss the problems and plans of various agricultural agencies, and they allow a concerted effort toward solution of those problems. The October meeting was devoted in part to informative talks about the Crop Reporting Service, which is one of the oldest agencies in the Department of Agriculture.

E FURROWS

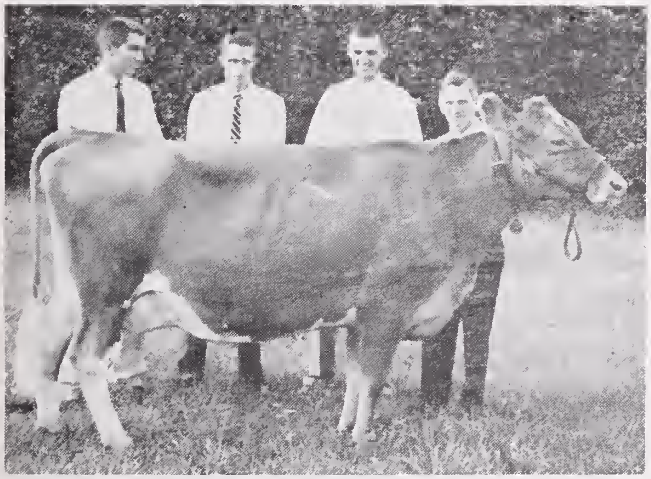
OWDEN



DAIRY CATTLE JUDGING TEAM WINS

Clemson College's dairy cattle judging team, coached by C. C. Brannon, professor of dairy husbandry, competed Sept. 30 in the international contest at Waterloo, Ia. Thirty schools vied for intercollegiate honors as part of the National Dairy Congress program.

The Clemson team won first place in the nation in the judging of Holstein. The Dairy Department is proud to have a judging team capable of winning top honors in the judging of one of the nations leading breeds of dairy cattle.



Clemson was represented by (left to right) Jack R. Roberts, Mauldin; George W. Powell, Williston; and Lanny W. Moore, Bradley, all senior dairy students. Professor C. C. Brannon is on the right.

(Clemson News Bureau Photo)

SCHOLARSHIP WINNERS ANNOUNCED

The 1957-58 recipients of 10 annual Sears-Roebuck Agricultural Scholarships, valued at $200 each, have been announced by Dr. J. W. Jones, Director of Agricultural Teaching.

They are: Rufus Brown, Kingstree; Joseph H. Knight, St. George; Joseph D. Mills, Blackstock; William S. Rowe, Charleston; Paul H. Smith, Gibson; Don L. Willis, Fountain Inn; William J. Sears, Olar; Angus W. McGregor, Hopkins; Ralph J. Johnson, Alcolu; and Jones W. Bryan, Luray.

It was simultaneously announced that Thomas S. Harmon, Lexington, has been awarded Sears' sophomore renewal scholarship of $250. This annual award goes to the scholarship holder with the highest scholastic average as a freshman.

ALPHA TAU ALPHA RECEIVES NEW MEMBERS

The Kappa Chapter of Alpha Tau Alpha, the National Professional Agricultural Education Fraternity, held its initiation for new members on Oct. 11. The new members are as follows: Billy R. Abercrombie, Fountain Inn; John W. Parris; Campobello; Elbert D. Porter, Loris; Donald R. Barnette, Clemson; and Thomas C. Childress, Clemson. Adger Carroll spoke to the group on his trip to be made to the National Convention of the Future Farmers of America in Kansas City. Adger is the Kappa Chapter representative to this convention.

LIVESTOCK TEAM JUDGES

The Clemson Livestock Judging Team participated in the Mid-South Inter-collegiate Livestock Judging Contest, Memphis, Tennessee, September 21. The Clemson Team placed fourth in cattle, and James E. Yonce of Trenton, South Carolina, was the second high individual in the cattle judging contest.

The team also participated in the Southeastern Fair at Atlanta, Georgia, on October 7, and placed fifth in this contest.

Plans are for the team to terminate this year's judging activities with their participation in the International Livestock Exposition which will be held at Chicago, Illinois on November 30th.

SHOW AND SALE

There is to be a Berkshire Type Conference Show and Sale at Clemson January 23 and 24, 1958. This conference will be open to all Berkshire breeders in the United States.

AGRICULTURAL ECONOMICS MEETINGS

Most of the members of the Agricultural Economics staff attended the annual meeting of the American Farm Economic Association at Lake Junaluska, North Carolina, the last week of August. Dr. E. E. Brown appeared on one of the programs and Dr. G. H. Aull, a past president of the AFEA, participated in committee meetings with reference to affairs of the association.

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The Men Who Guide Us . . .

Professor William Monroe Epps, a native of Dillon County, South Carolina, has recently become Head of the Botany and Bacteriology Department at Clemson College.

Dr. Epps received a B.S. degree in Agronomy from Clemson in 1937 and a Ph.D. in Plant Pathology at Cornell University in 1942. In 1942 he served with the U. S. Infantry and later with the Biological Chemical Corps in Maryland.

After leaving the army Dr. Epps returned to South Carolina, where he became a plant pathologist at the Clemson Truck Crop Station at Charleston. While he was there Dr. Epps did a great deal of work on diseases of such crops as tomatoes, cucumbers, cabbage, and potatoes.

He met with success in his attempt to develop a variety of tomatoes that would be disease resistant. Some varieties that he worked with may be suitable for releasing in the near future.

In August, 1956, Dr. Epps returned to Clemson as Head of the Botany and Bacteriology Department. In continuing to follow his interest in plant disease, he teaches plant pathology.

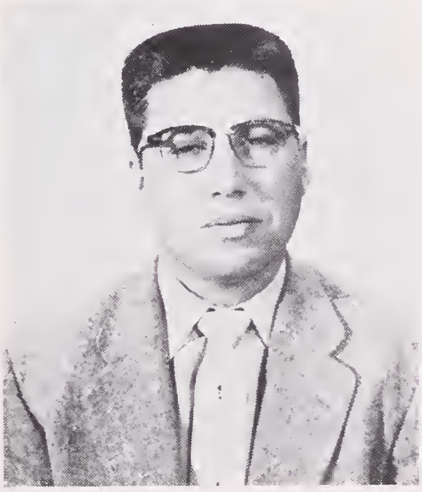
While at Clemson College and Cornell University he was active in Alpha Zeta, Agronomy Club, Phi Kappa Phi, and Sigma Phi.

At present Dr. Epps is on the faculty advisory committee of the S. C. Chapter of Alpha Zeta, and he is a Steward in the Methodist Church.

One of the new faces in the Agronomy Department is that of Dr. Moore. He is with us for the first semester, and he is teaching Agronomy 101 and Agronomy 306 at the present time.

Dr. Moore is a native of Ohio. He received his B.S. degree from Ohio State University and his M.S. degree from the University of Kentucky. After finishing his undergraduate work, he served as Associate County Agent in Ohio. He was the leading figure in the promotion of 4-H Club work in that county. While working as a full-time instructor teaching courses similar to those he is now teaching, he received his Ph.D. degree from Ohio State University. He also did research for a year at Iowa State College in dairy nutrition. He served over thirty months with the armed services, sixteen of which were spent in Europe during World War II. He is now a member of Phi Epsilon Phi, a Botany honorary association, and the American Society of Agronomy.

Dr. Moore is married, and he plans to make his home in Clemson. He has a great interest in teaching, and his farm background in Ohio was influential in his decision to select a course of study near the soil, that of agronomy. He is looking forward to his work at Clemson College. Dr. Moore will play a very important part in the training of men at Clemson in their courses in agronomy. We will add him to our long list of "men who guide us."



Dr. Kenneth Frazer Moore

Dr. Wayne L. Ogle is one of the newest professors in the Horticulture Dept., at Clemson. He was reared in Knoxville, Tenn., and he came to Clemson in February of this year. He received his B.S. degree from the University of Tennessee and his M.S. degree from the University of Delaware. He served in the army for over three years. After receiving his Ph.D. degree from the University of Maryland, he taught at the University of Rhode Island for three years. He did research on various phases of plant breeding while teaching there. He has written numerous publications and articles on various subjects. Chemical weed control, processes for grading tomatoes, the use of foliar nutrition spray on vegetable crops, and the effect of heat processing on tomato juice color are a few of the subjects about which he has written.

Dr. Ogle is a member of Sigma Xi and the American Society for Horticulture Science. His work at Clemson will be similar to his work at the University of Rhode Island. He will teach and carry on research. He is now doing research on the breeding of vegetable crops, with emphasis on sweet potatoes and southern peas. His research work will also include the testing of vegetable varieties and the use of irrigation on vegetable crops.

Dr. Ogle likes Clemson very much, and he and his family will make their home in Clemson. He will be a great help to the students, and his research in the horticultural crops will aid the farmers of the state.

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Clemson Hails New Four-Year Curriculum in Forestry

By Garland Gravely, Forestry '59

Some of the Forestry majors get practical training as a part of their new four-year course. Those shown (left to right) are as follows: J. D. Smith, W. M. Bruner, G. E. Sabin, G. S. Adams, and E. G. Gravely with the saw.

After a long, hard struggle that began in 1903 with a two-hour, one-term Senior lecture, the Clemson Forestry Department has finally achieved its goal. This struggle culminated the past summer when the State Legislature appropriated funds for the establishment of the now-instated four-year forestry curriculum. Not only will this program provide for the education of students choosing forestry as their profession, but it will also increase the research, demonstrational, and the forest management programs of the department. Carl Dalton, a former Clemson pre-forester and a graduate of the Michigan School of Natural Resources, was appointed assistant forester in the department. He is helping with the tasks of managing the extensive forest lands of Clemson. The first member added to the academic faculty will assume his duties during the second semester of this scholastic year. The academic curriculum, having been approved by the administration of the college, is now in effect. New subjects taught this semester are silvics in the sophomore year; silviculture, aerial photography in forestry, and forest entomology in the Junior year. Every effort is being made to have the four-year curriculum accredited by The Society of American Foresters before 1959, when the present Junior class will graduate.

The number of students majoring in forestry has increased by leaps and bounds during the past three years. The present junior class started its freshman year in '55 with approximately 15 students. At present the membership record of our newly-established Forestry Club shows that there are approximately 35 freshmen, 20 sophomores, and 11 juniors enrolled in forestry. Trends in increased enrollment of the past years indicate that the Forestry Department will continue to have an adequate number of students. We can assume, therefore, that the Forestry Department and the forestry activities of Clemson will continue to grow.

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AG CLUBS

(Continued from page 7)

the faculty of the college. and to promote interest in forestry.

The idea for the club was the result of a spontaneous response by both the students and the faculty. The club will hold its meetings bimonthly.

These officers were elected at the first meeting:

Garland Gravely, President: Bill Bruner, Vice President; Guy Sabin. Secretary; Michael Mangum, Treas.

Gerald Adams is the program director, and Carl B. Dalton, assistant forester in charge of forest management, is the advisor.

FUTURE FARMERS OF AMERICA

The Clemson Collegiate Chapter of F.F.A. meets on the second Tuesday of each month in the Student Center at 6:30 p.m. All students majoring in Vocational Agriculture Education and other students interested in continuing their association with the F.F.A. program are invited to attend the meetings.

This year's officers for the Clemson Chapter are:

John Parris, President; Billy Abercrombie, Vice President; Andrew Cross, Secretary; States McCarter, Treasurer; P. C. Cochran, Reporter: Hugh McClimon, Sentinel.

Professor F. E. Kirkley is the faculty advisor.

HORTICULTURE CLUB

The Horticulture Club is an organization open to all students interested in any phase of horticulture. During the initial meetings this fall plans were laid for the current school year. The primary project this year will be the promotion of agriculture in general and horticulture in particular. The club will state its case for horticulture in folders which will be mailed to prospective Clemson students. The club also plans to send two delegates to the Southern Agricultural Worker's convention in Little Rock next February. On October 15 the club had a supper in honor of Professor A. M. Musser, Head of the Horticulture Department.

The officers for this year are:

Richard E. Reynolds, President; Johnny Thomason, Vice President; Sammy E. Plowden, Secretary; James Blackwell, Treasurer.

The club meets every first and third Tuesday night at 7:00 in meeting room number eight. Prospective members are invited.

KAPPA ALPHA SIGMA
(Agronomy Club)

The purposes of Kappa Alpha Sigma are to foster a spirit of cooperation and mutual helpfulness among its members and the members of the staff of the Agronomy Department, and to stimulate interest among students in the profession of Agronomy. The club is very active this year, and a perfect attendance was recorded at the last meeting.

Kappa Alpha Sigma membership is open to all undergraduate students who have agronomic interests and are majoring in agriculture.

Kappa Alpha Sigma meets every first and third monday at 6:15 in the P&A Building.

This year's officers are:

Robert L. Stephens, President; Frank Hires, Vice President; Bruce Bates, Secretary; Donald Eaddy, Treasurer; Bruce Byrd, Corresponding Secretary.

4-H CLUB

The Clemson College 4-H Club was organized in order that Clemson students who are former 4-H members or any agricultural students who are interested in 4-H Club work may continue their broad educational development and become better citizens. Emphasis is placed on further opportunities for leadership and social development. This organization also helps the members better understand The Agricultural Extension Service and the objectives of junior 4-H Club work.

Students who are former 4-H Club members may become active members, and associate membership is available to other students. The club meets on the second Thursday of each month at 6:30 p.m. in the student center. The officers for this year are:

Curtis E. Wallace, President; Larry Edwards, Vice President; Rudolph Blakely, Secretary; John Bailes, Treasurer; Frank Sutherland, Sergeant-at-Arms; Jerry Bailes, Parliamentarian.

The faculty advisors are Dr. W. A. King and Mr. H. O. Vaigneur.

RURAL YOUNGFOLKS DAY

(Continued from page 5)

concerning this special youth day: "Based on all reports and observations, Rural Youngfolks Day proved very successful. The interest shown on the part of the various departments in arranging demonstrations proved the desire of the college to make the day interesting and educational. The entertainment and drawing for prizes added to the enthusiasm for the day. Much credit is due all who had a part in planning and supervising the activities."

This program was conducted by a special Farm and Home Week Committee consisting of Dr. J. W. Jones, Faculty Chairman; Dr. W. A. King, professor of dairying and faculty advisor for the Clemson College 4-H Club, Leon O. Clayton, state boys 4-H club agent, and W. C. Bowen, associate professor of Agricultural Education. This committee was assisted by members of the factulty and Clemson students.

DANFORTH FELLOWSHIP

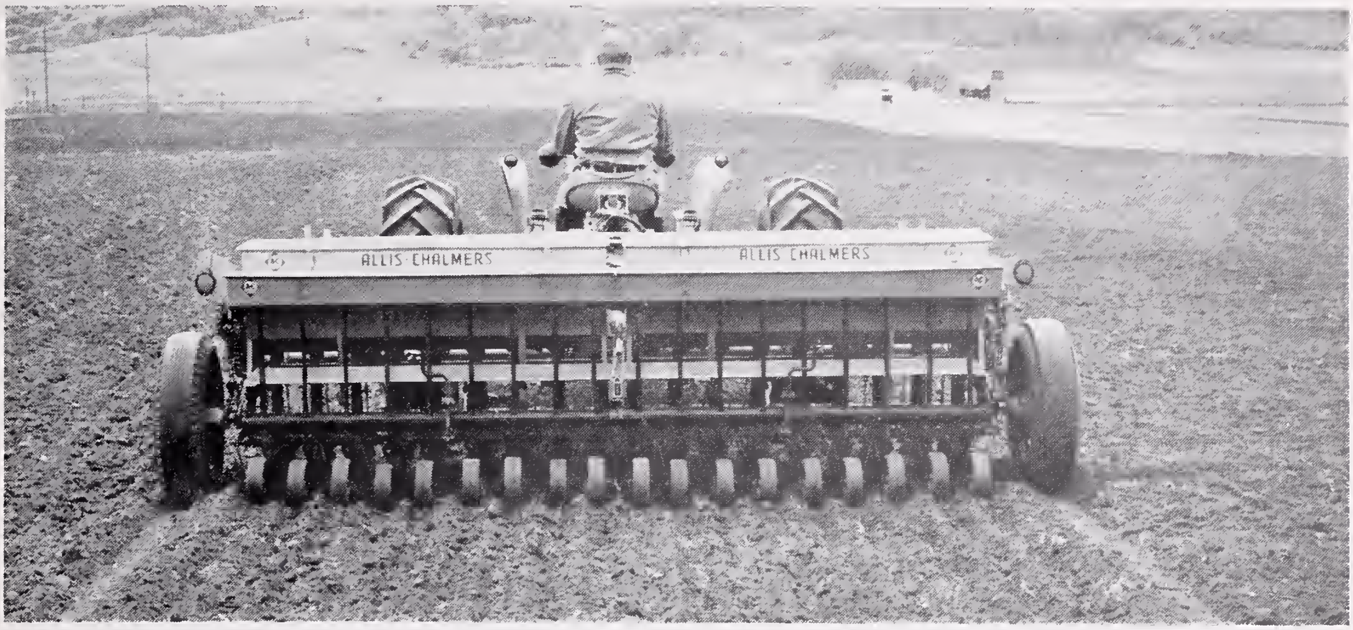
(Continued from page 2)

of 16 up, and I am sure everyone benefited greatly. We had classes, sports, games, and social functions, all stressing the four-fold way of life. I met many boys from all parts of the country and developed friendships with many of them that I shall never forget. It is hard to say which was the better part of the fellowship, the Camp or the St. Louis experiences; they were both "tops" in my book.

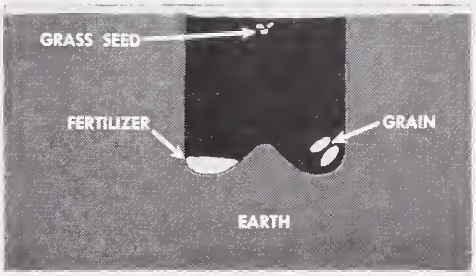
Mr. Danforth whom I referred to earlier, passed on a couple of years ago, but he will never be forgotten, especially at Camp Miniwanca. Many of his challenges and ideals are on plaques and can be found almost anywhere on the camp grounds. One of his most familiar phrases was **"I Dare You!"** and he wrote a book with the same title. This book is very inspirational, and I recommend it for everyone's reading list. Mr. Danforth was a very interesting person. He had a knack for daring and challenging people. He made a continuing search for ways to help people who tried, and was constantly busy doing something all the time. Mr. Danforth was a great success in many ways; you can be too! There are books about Mr. Danforth's life, and it would pay anyone to read

(Continued on next page)

You should see what's happened to the Drill!



Three new and larger models are now available in 15 x 7 (8¾ ft.), 18 x 7 (10½ ft.) and 24 x 7 (14 ft.) sizes. These wheel-transported drills can be used with any make of tractor equipped with standard ASAE drawbar and remote ram, or with the SNAP-COUPLER hitch and TRACTION BOOSTER system of Allis-Chalmers tractors.



Seed and fertilizer are accurately placed in separate bands for protection against "burning."

Grain drills are a lot different from what they used to be!

Today, the seeding of small grains, beans, hay and pastures is accomplished with greater precision, speed and economy than ever before. Reason? The ALL-CROP drill — a product of Allis-Chalmers.

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Of utmost importance to farmers is the fact that with these more modern drills, seed and fertilizer are placed *in separate bands* . . . at the precise rate per acre for best results. Seedlings are able to take early advantage of needed plant food . . . without being "burned" in the process!

Kernels are sown uniformly — never in wasteful bunches — and much less seed is required to obtain desired plant population per acre. Lumpy fertilizer is broken up by Force-Flo agitators in the fertilizer hopper . . . to assure uniform distribution. Grass or legume seed can be sown broadcast or in bands, as desired.

ALL-CROP drills are available in five sizes, with choice of single or double-disc openers. Seeding capacity ranges from 20 to 75 acres per 10-hour day, depending on size of unit and condition of field.

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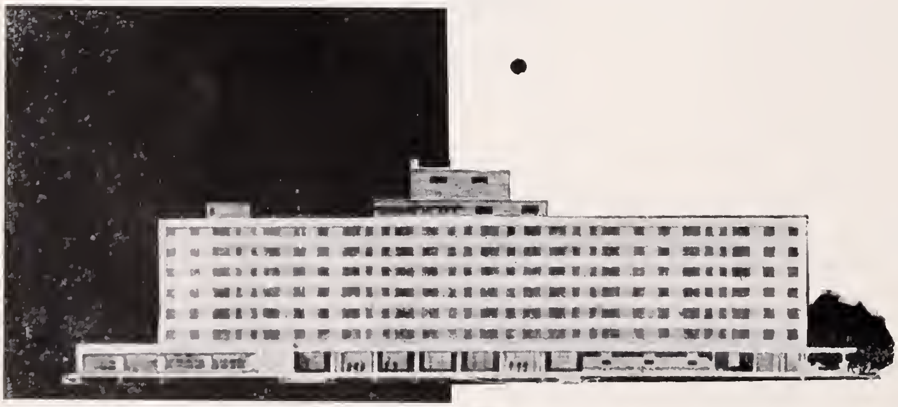

In the foothills of the beautiful Blue Ridge Mountains, you'll find the Clemson House located in a unique setting — right on the campus of Clemson College. Here you will find all of the services of a great metropolitan hotel yet you will be far away from the noise of a large city. And you'll enjoy the beautifully landscaped grounds and the flower beds. The splendid accommodations and the excellent cuisine offered at the Clemson House are combined with warm friendly hospitality and fine service. The Clemson House is a gem among fine hotels, and the rates are almost unbelievably low. All rooms are air conditioned. Four dining rooms and the Tiger Lounge and Coffee Shop. There is swimming, fishing and golf nearby

FRED L. ZINK, JR., Manager

On East Edge of Clemson, S. C., on U.S. 78, 123 and State 28.

Clemson House

AAA

DANFORTH FELLOWSHIP

(Continued from page 14)

about him and then try to equal his accomplishments.

In summing up my experiences this summer at the Danforth Fellowship, I'll relate some of the benefits I have received which are prominent in my life; 1) An opportunity to see practical research demonstrated. 2) Lectures on agricultural subjects by men who successfully use them for their living. 3) Tours of the latest in laboratory methods and facilities. 4) A means of contact for use in job applications with many companies. 5) Broadening of our horizons by studying the relationship of agriculture to many types of business. 6) The close fellowship and exchange of ideas with topnotch agricultural students and future leaders throughout the country.

I would like to close by encouraging every underclassman who reads this article to try his level best to be the recipient of a Danforth Fellowship.

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The Agrarian

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VOLUME XVII NUMBER 2

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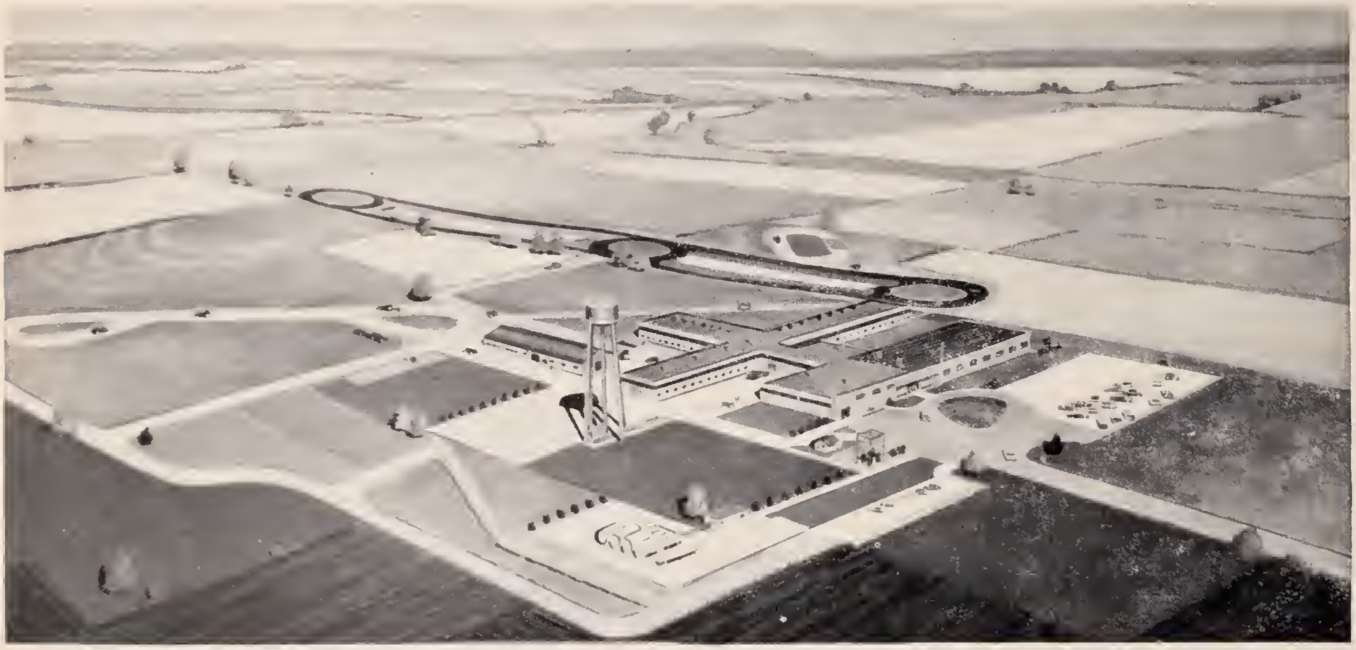
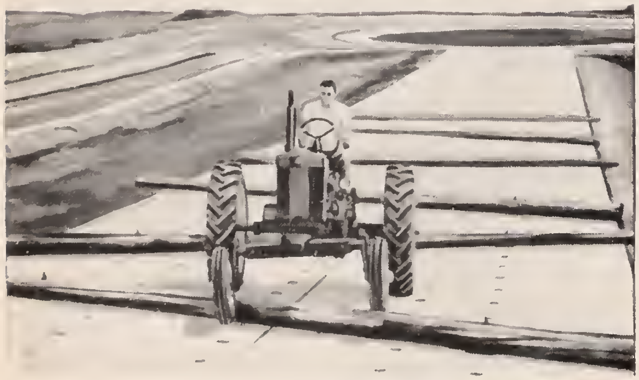
The New John Deere Research and Engineering Center Keeps Tractor Quality at Its Highest



The new John Deere Research and Engineering Center near Waterloo, Iowa.



This obstacle course subjects test tractors to punishment far in excess of that encountered in normal field operations. Any weakness can be quickly spotted and corrective steps taken.

This mud bath, in which can be mixed varying amounts of sand and clay, enables John Deere engineers to check the effect of water and abrasives on wheel and axle bearings and oil seals.

QUALITY is a particularly precious commodity in the farm equipment industry. From quality stems the faith and subscription that make one manufacturer's product more acceptable than another's. Tractors are a good example. At John Deere, tractor quality is guarded with a vengeance. The words of the blacksmith, spoken more than a century ago, still ring loud and clear—"I'll never put my name on an implement that hasn't in it the best that is in me."

To this end, a year-'round program of research and testing is carried on in this modern John Deere Research and Engineering Center near Waterloo, Iowa. Here, through the media of the test tube and test track, with the aid of modern electronic and mechanical testing devices, the science of agricultural engineering and development pursues the goal of ever-higher tractor quality. The success of this program is evident by the growing number of John Deere Tractors that are a familiar part of every rural landscape. The important role played by the new Research and Engineering Center is another "built-in" feature that makes the John Deere dealer franchise the most valued in the farm equipment field.

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MOLINE, ILLINOIS

The Agrarian
OFFICIAL STUDENT PUBLICATION

Volume XVII The Clemson Agricultural College Number 2

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AGRARIAN PHILOSOPHY

For some time there has been a need for an organization that would unify the students of agriculture as a group. At last there is being formed such an organization—a council composed of representatives from all student agricultural clubs. Departments which have no departmental club will also have a representative.

There are eleven organizations within the School of Agriculture at the present—does the need exist for this additional organization? The answer is definitely yes—partly by virtue of the fact that there are so many at the present. A principal function of the council will be to coordinate the activities of the various clubs. This council may become very powerful, but it will never take the place of the other agricultural clubs. It may become very strong, but it will never lessen the strength of its constituent organizations. In fact, it should serve to strengthen them.

Many of the present organizations are very active, but the scope of their activities is limited by their size. However, by working together through a council, the resources of all these clubs could be pooled in the execution of a more comprehensive project. An important project of the council could be publicizing and promoting Clemson's School of Agriculture. Many prospective college students—and many students already enrolled in college for that matter—don't realize how rewarding a college education in agriculture is. Nor do they realize how many job opportunities are available to the agriculture graduate. The council could do much to inform these people of the true meaning of a college education in agriculture. Another important function would be to advise the Dean of the School of Agriculture in matters pertaining to student affairs.

The concept of an agriculture student council is not new—such councils are operating successfully in many colleges throughout the nation. Their activities aren't all work and no play, either, for many sponsor such social projects as dances, agricultural school days, and picnics. How strong the agricultural student council at Clemson will be depends entirely on student support. The students will determine the nature and success of its activities.

—G. E. S.

SERVING THE FARMERS
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CLEMSON MILK

By
Lanny W. Moore, Dairy '58

Did you ever consider how a glass of milk, which you just had for dinner in the dining hall, was processed? It is quite an interesting story that can best be started at its beginning, the cow.

The cows at Clemson are milked by mechanical milkers in a sanitary dairy barn. The milk from each cow is weighed after each milking, which occurs twice daily. Only milk from healthy cows is used for human consumption. All cows at Clemson have high production records, except those cows that may be held for experimental purpose in spite of their low production. The feeding of good quality concentrates and roughages is one of the factors responsible for a high quality milk.

Immediately after each cow is milked, the milk is pumped over a surface cooler which reduces the temperature of the milk approximately 35° F. After cooling, the milk flows into an insulated, stainless steel tank truck, where it is stored until all the cows have been milked. At this time it is transported to the modern dairy manufacturing plant located in the south wing of the Food Industries Building.

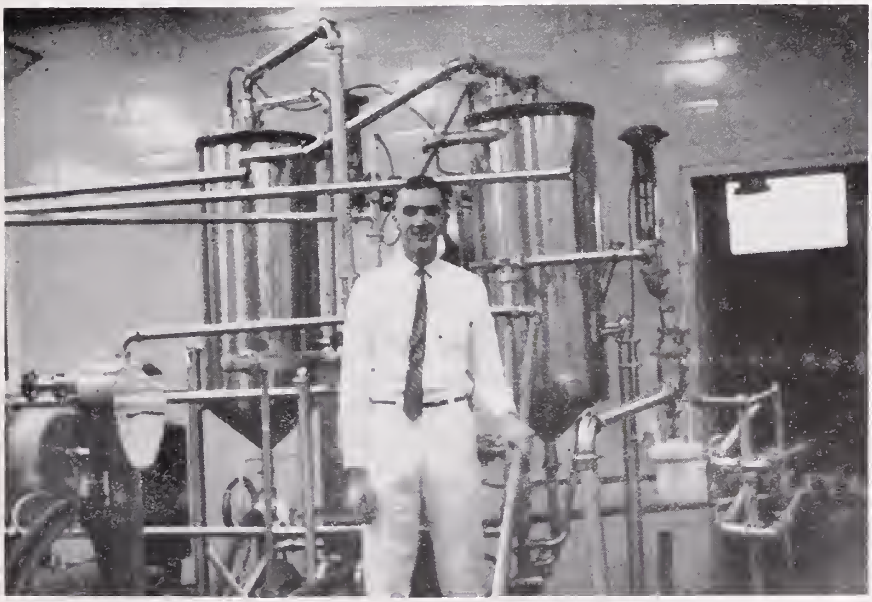
On arrival at the plant the milk is pumped out of the truck tanker through a clarifier and into a refrigeraterated stainless steel storage tank. After the milk is received in the plant it is ready to be pasteurized. Even though the raw milk is produced by healthy cows under sanitary conditions, pasteurization provides further assurance for the consumer that he is drinking a safe, wholesome product. The pasteurizer at Clemson is the second one of its kind to be installed in the United States and the first to be installed in a college. It is a Vacu-Therm pasteurizer which has the operating ability for standardizing the flavor of milk.

The Vacu-Therm pasteurizer consists of a series of heat transfer plates equipped with two vacuum chambers. The flow of milk through this high - temperature short - time machine is as follows: the raw milk is drawn by vacuum through a pre-heater into the first vacuum chamber. In this pre-heater the temperature of the milk is increased from 40° F. to 138° F. The heating media in the pre-heater is hot pasteurized milk. A stainless steel plate keeps these milks separated. While the milk is in the first vacuum chamber, the non-soluble gases are removed.

A positive displacement pump draws the milk from the first chamber and pumps it through the heating section of the heat exchanger. Steam under reduced pressure is the heating medium. The heat of the steam passes through a stainless steel plate and into the milk in this section. The milk on leaving the heatin section flows through a stainless steel tube with a sensitive thermometer located in a flow diversion valve. If the temperature of the milk were not 161° F, which is the temperature of pasteurization, the valve will divert the heated milk and cause it to flow back to the raw milk side of the pasteurizer. The functioning of this valve assures proper pasteurization.

After the milk is properly pasteurized, it flows into the second vacuum chamber. This chamber is maintained at reduced pressure; therefore, the hot milk flashes immediately to the corresponding temperature of that vacuum. This change in temperature causes the volatile substances, such as off flavors, if present, to be removed from the milk. This improves the flavor and tends to produce a standardized flavor of the milk. The vacuum treated milk is pumped from the second vacuum chamber to a homogenizing machine. The homogenizer breaks up the particles of butterfat into smaller units. These small units of butterfat do not cream in milk; therefore, all portions of the milk contain equal amounts of the fat.

(Continued on page 14)



Lanny shows justifiable pride in the Dairy Department's pasteurizing equipment.

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The Voice of Clemson

By John Parris, V. A. E. '58

At the mike is J. R. Mattison, director of the "Voice of Clemson" programs.

Mr. J. R. Mattison (better known as Bob) of the Clemson College Extension Service presents the daily radio program known throughout South Carolina and adjoining states as the VOICE OF CLEMSON. Thousands of farm people and others affiliated with agriculture await with much interest the familiar greeting —"Hi there everyone, this is THE VOICE OF CLEMSON coming to you from our Clemson House Hotel!" Bob's friendly and informal discussion has to do with things of interest in agriculture. The aim is to break down the technical aspects of today's agriculture in a simple everyday language so all can understand and thus reap the benefits of the research work. The program varies each day as specialists in the field of agriculture and home economics assist him in answering questions concerning the problems of the farm and home.

Mr. Mattison's childhood experiences on a Pickens County farm inspired him to serve the farm people of this state. He began his work with Clemson College as an assistant in the Botany Department while in high school. He later enrolled at Clemson to major in Entomology and Zoology. He received his B.S. Degree in 1935. After graduation he became Assistant Professor of Bacteriology. Most of his time, however, was spent in research study on cotton diseases. In 1937 he moved to the Pee Dee Experimental Station where he did research work in all agricultural crops with his main interest in tobacco. He had charge of laying out the plots for the first tobacco experimental station.

In 1946 Mr. Mattison returned to Clemson to continue research and developmental work with aromatic tobacco. He began his radio work with the Extension Service in 1952. Today the radio program demands most of his time but he is still affiliated with Clemson's tobacco developmental work. Besides the many farm programs he originates for radio, he also assists with athletic interviews for radio stations, and announces the high school, college freshmen, and the varsity athletic contests held at Clemson. The radio programs he presents are far reaching in the effort to be of service to South Carolina farm people as well as adjoining states. North Carolina and Georgia radio stations carry the Clemson program. There are 65 radio stations in South Carolina now carrying appropriately 22 programs each week. Mr. Mattison is looking forward to the time when Clemson College will telecast THE VOICE OF CLEMSON program directly from the new and modern Plant and Animal Science Building. Clemson's own television station may not be too far in the future. Modern radio and television studios have been built in the Agriculture Center.

Mr. Mattison does not limit his work to farm people and the numerous athletic events. Much of his time is spent assisting college students, the faculty, and the departments with special radio programs.

Mr. Mattison is a Methodist, but attends the Baptist Church with his family. All in all, he is a high type farm boy with an unusual interest in farm people and their problems. He is typical of the outstanding men and women working in the Extension Service. Bob Mattison's dedicated life for service to others in agriculture expresses his love and devotion for rural life.

Now being better acquainted with Bob Mattison, I am sure we will all lean closer to our radios for this up-to-the-minute report on agriculture progress as the air waves sound the familiar greeting — "HI THERE EVERYONE, THIS IS THE VOICE OF CLEMSON."

A New Threat To Corn - - -

WITCHWEED

By

Richard H. Holstein, III, Agron '59

Farmers of South and North Carolina have found a new menace to their corn, sugarcane, sorghums, many of their grasses, certain sedges, and some broadleafed plants. Witchweed (Striga asiatica) has established itself as quite a threat on the coarse textured and sandy soils in several of the counties of the Carolinas. The counties affected in South Carolina are Dillon, Horry, Marion, Marlboro, Darlington, and Florence.

Reports of a mysterious disease were first made in August 29, 1951. The diseased plants had symptoms similar to those inflicted by drought. In July 1956 some of the affected corn plants were sent to North Carolina State College for examination. It was there that a graduate student from India directed attention to underground stems of the genus **Striga**, which resembled stems that attack sugarcane, in the Eastern Hemisphere. After this discovery the plant was soon found to be the parasitic witchweed.

Due to the destructive potential of this parasite, Agronomists and Botanists immediately initiated research programs to provide knowledge in an effort to bring about the control or eradication of the parasite.

However, there is a mojor difficulty involved in research. The genus **Striga** has heretofore been known only in Africa, Asia, and Australia. The first job for the scientist will be to determine whether or not the growth habits in this continent are the same as in the countries they have previously plagued. A method for control under U. S. conditions is the goal of the Agricultural Research Service.

The witchweed is a deceptively pretty plant, with bright green stems and leaves and showy red flowers having yellow centers. The blossoms are shaped somewhat like violets. The weed usually ranges in size from 6 to 12 inches, and occasionally it reaches a height of 18 inches. It has multiple branches, both near the ground and higher on the plant. The leaves are long, narrow, and fuzzy in appearance. They are in pairs opposite each other on the stem, which also has a fuzzy appearance. As the stem grows and branches, more flowers come to bud, and the plant continues to bloom and produce seed pods throughout the season. A single plant in the span of one season can produce 50,000 to 500,000 tiny seeds, which can barely be seen by the naked eye. These seed can lie dormant for as long as 20 years awaiting a suitable host.

As a rule, the witchweed seed generally require a rest period of 15 to 18 months before germination; however, some begin to develop before this period is over. The host plant produces a chemical referred to as a "host extract" which initiates the germination of the witchweed seed. The fact that the seed have to be as close as three or four millimeters to the root before germination is no problem to the parasite because of the many seeds that are in the ground and the large network of roots and root hairs of the host. The "host extract" not only serves as a stimulant to witchweed germination, but also serves as a guide for the parasitic roots to the roots of the host.

When the witchweed seedling starts to grow, it must contact, attach to, and penetrate the roots of a host. Otherwise it dies.

After the penetration, the parasite derives its food, water, and minerals from the host until it emerges from the soil, which takes about 30 days. After emergence the plant turns green and manufactures its own food but still depends partially on the host for water and minerals.

Flowering begins about 20 days after the seedling emerges, the first flowers appearing at the base of the plant. Four weeks after flowering the seed pods burst, and thousands of tiny seed are released to continue the life cycle. The time from germination until the release of seed is about 90 to 120 days.

The first symptom of witchweed infestation is the wilting of the crop. Gradually the parasitic roots make more penetrations and the plant appears to be drought stricken. The plant first turns yellow, then brown, and sooner or later, depending upon intensity, dies.

The first years of infestation are so light that very little attention is given to it. But each year the damage is compounded, and the corn grower finds himself in quite a serious situation. In the Anglo-Egyptian Sudan losses have been reported as high as 66 per cent, and a loss of 25 to 33 per cent is very common. A scientist making a survey of insects and other pests of corn in Mozambique, southeast Africa, is quoted as saying, "Witchweed is the worst enemy of corn."

Witchweed prefers the coarse textured or sandier soils, but it is by no means confined to this type soil. It has been known to thrive in the heavy clay of the Anglo-Egyptian Sudan.

The soils of the counties known to be infested lie within the Norfolk-Ruston soil group, which is comprised mostly of soils ranging from coarse sands to fine sandy loams.

(Continued on page 14)

First in the nation . . .

CLEMSON'S NEW GINNING ENGINEERING PROGRAM

By
J. K. Merck, Ag. En. '58

Ginning Engineering students conduct a laboratory at the Southeastern Cotton Ginning Research Laboratory at Clemson. From left to right (standing) David Chandler, James Merck, James Mullins, Sidney Nunnery, and Dan McGill. Kneeling are William Gladden and Zachary Henry.

There are many "firsts" in the history of cotton. Ancient records unearthed in the ruins of the city of Mohenjo-dare in the Indus Valley of India indicate that these ancient Indians were the "first" to successfully gin cotton with a cotton gin. Now Clemson College can boast a "first" in the cotton industry. Clemson College is the first college in the United States to offer a graduate course in ginning engineering.

This brings to mind the question—"What is Ginning Engineering?" Briefly, ginning engineering is the application of engineering principles to the processing and ginning of seed cotton. Processing and ginning include all these operations which expedite the separation of the seed from the lint. Some of the more important operations in this process are drying, cleaning, bur extraction, and lint cleaning.

The need for instruction in ginning engineering has been seen for a number of years. The program was organized in the Agricultural Engineering Department and was made possible through the joint efforts of Clemson College and the National Cotton Council. Completion of the program leads to a master of science degree in Agricultural Engineering with concentration in ginning engineering.

Two new courses in Agricultural Engineering are being taught specifically for the student pursuing the engineering concentration. The basic course, entitled "Fundamentals of Ginning Engineering," is available to both undergraduates and graduates. In this course an engineering analysis is made in all phases of ginning such as handling, storage, drying, separating lint, cleaning, pressing, disposing of foreign matter, quarantine treatment, power requirements, and safety precautions.

The advanced course, entitled "Advanced Ginning Engineering," is organized at the graduate level. Since this course is for graduate students only, the problems studied are more specialized and complex. Emphasis is placed on design, development, analysis, and synthesis of gin machinery to meet the functional requirements necessary for processing and handling cotton in a modern gin establishment. Materials handling, air requirements, horsepower requirements and layout design are specific problems in cotton technology. Class problems are assigned for a term problem.

Presentation of a thesis is required by all candidates completing the ginning engineering program. The selection of the thesis problem is left to the student; however, the problem must be approved by the student's advisory committee.

Facilities at Clemson for carrying out the ginning engineering program include: The Southeastern Cotton Ginning Research Laboratory, School of Engineering, School of Agriculture, School of Textiles, the Cotton Fiber and Spinning Laboratory, and the Division of Technical Services of the American Cotton Manufacturers' Institute, Incorporated.

At present, there are seven students enrolled in the basic course. Four of these are graduate students, of which three are on fellowships provided by the Murray Gin Company, and the Clayton Fund. These three fellowships are provided each year to help interested students pursue the ginning engineering program. The undergraduates enrolled in this course are seniors majoring in Agricultural Engineering, who are interested in ginning engineering. The graduate students will continue in the advanced course next semester.

Dr. J. H. Anderson, Associate Profesor of Agricultural Engineering, is in charge of the ginning program at Clemson. Laboratories are conducted at the Southeastern Cotton Ginning Research Laboratory. This laboratory is headed by Mr. James A. Luscombe, United States Department of Agriculture.

(Continued on page 14)

BETWEEN

Sowed by SA

BRIGHT FUTURE IN AGRICULTURE

The future of students in agriculture looks bright. The total undergraduate enrollment in agriculture in U. S. has decreased by 8,000 since 1948. This decrease in the number of students taking agriculture in college is leaving unlimited jobs open for every man graduating in agriculture. At the present trend, the number of open jobs will increase.

DAIRY TEAM JUDGES

Clemson's Dairy Products Judging Team placed fourth in overall team scoring at the Southern Dairy Products Contest in Athens, Ga.

Al Soudan was high individual of the Clemson team, and was followed closely by Morris 'Buddy' Bond and Ken Locher. The team coach is Dr. D. M. Graham, Associate Professor of Dairying.

BLOCK AND BRIDLE DELEGATES

Delegates from the Clemson Block and Bridle Club to the National Convention in Chicago in December were H. Todd Arant, Bowman, South Carolina, and P. C. Cochran, Manning, South Carolina.

NEW COURSE TO BE OFFERED

Agriculture 302, Agricultural Extension, is a new course to be offered for the first time in the second semester of 1957-58. The 2-credit course consisting of two class hours per week, with no laboratory, will be offered as an elective for juniors and seniors. It will be taught by Mr. M. H. Sutherland, Assistant in Farm and Home Development, with the Extension Service.

The course description is as follows: "An introductory course designed to acquaint students with the Cooperative Extension Service; its place among other educational agencies; its purpose, philosophy and objectives; how it operates and the results obtained; its social and economic significance; and the use of research data in the development and conduct of the Extension Program."

FIRST ALL COLLEGE OPEN HOUSE

Clemson will hold its first open house in which the entire college will participate on March 29, 1958. All the schools will have a display or demonstration. Final plans have not been completed.

FACULTY SEMINAR

A faculty seminar on agricultural instruction, initiated in 1956-57, is being continued this year. On October 17, Professors J. B. Monroe, B. H. Stribling, and E. E. Waite conducted a panel discussion of "The Learning Process." "Counseling with Students" was the subject of the seminar on November 21. The guest speaker was Mr. John B. Gentry, Director of Personnel at Clemson. On December 12, Professor R. E. Ware lead a discussion of "The Use of Audio-Visual Aids in Teaching."

DAIRY CLUB FIRST

The Dairy Club won first place in campus display on Homecoming weekend. Fourteen organizations erected displays in an effort to contribute to the success of the Homecoming festivities. All displays received high praises from the judges, but the final decision was that the Dairy Club display was tops.

RUSSIA USES "DOGS" CLEMSON USES "TERRAPINS"
CLEMSON
TERPNIK
DAIRY CLUB

Dairy Club members make a final check on their winning display.

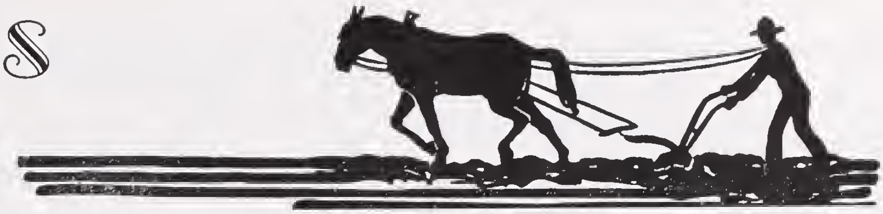
GROWTH CONDITIONS CONTROLLED

Plant growth conditions have been successfully isolated and controlled by a Clemson experimental team. A high frequency fluorescent lighting system has been installed that may produce several generations of plants per year and expedite breeding work significantly.

The research, began last fall, is conducted by E. B. Rogers, associate professor of agricultural engineering, and Carl J. Turner, assistant agricultural engineer, South Carolina Experiment Station.

E FURROWS

PLOWDEN



GARDEN CLUB PRESENTED PLANTS

Clemson College has presented approximately 5,000 crepe myrtle plants to the Garden Club of South Carolina for beautification purposes.

Dr. M. D. Farrar, Dean of Agriculture, states that the plants were distributed in the state to respective garden clubs as part of a co-operative project between the college and the state garden club organization. Mrs. J. T. Rutledge, Conway, state garden club president, reports that almost 200 communities shared in the distribution.

DAIRY SCHOLARSHIPS

A total of $6,300 will be awarded next fall to students majoring in Dairying. Three new $1,000 scholarships will be awarded in 1958 by the Coburg Dairy, the South Carolina Dairy Association, and the Ladies Auxiliary of South Carolina.

At present, Eskel Miller of Columbia is the holder of the $1,000 South Carolina Dairy Association Scholarship. George W. Powell of Williston was awarded the $1,000 scholarship given by the Coburg Dairy in Charleston. Powell also won a $300 Borden Scholarship. William R. Roberts of Anderson holds the Pauline Hanchel Dairy Scholarship, which is given by the Ladies Auxiliary of the South Carolina Dairy Association.

James Trammell of Woodruff, was this year's recipient of the Ralston Purina $500 Scholarship.

LIVESTOCK JUDGING TEAM COMPETES

The Clemson livestock judging team recently competed in the International Livestock Intercollegiate Judging Contest in Chicago, placing 26th in the nation.

The members of this year's team are: Hugh Ables, Westminster; Ted Hayes, Jr., Sellers; James B. Petty, Chesnee; Thomas N. Rogers, Fork; James Younce, Trenton; and William C. Weeks, Williston, Florida. Professor D. L. Handlin is the coach.

The livestock judging team is sponsored by the Animal Husbandry Department, the S. C. Livestock Producers, and the Block and Bridle Club.

ECONOMICS FACULTY

Dr. J. M. Stepp attended the Southern Economics Association in Memphis, Tennessee on November 7-9. He participated in a program on southern economic development.

EAT LIKE PIGS?

Can you imagine telling your children it's perfectly all right to eat like pigs after all?

Well, Professor Dale Handlin, who heads Clemson's swine program, says it might be a good idea if everyone ate like them. He thinks most people underrate the lowly pig's intelligence.

"Unlike most animals," he says, "the pig quits eating when he's had enough and goes off to lie in the shade. You often hear people refer to someone's eating like a pig, and generally they mean they're overeating. But it might be a good idea if everyone ate like a pig."

A.S.A.E. MEETS

The first annual meeting of the South Carolina section of the American Society of Agricultural Engineers was held in the Clemson House on November 22. The principal speaker was Jimmy L. Butt, St. Joseph, Michigan, national A.S.A.E. secretary.

IRRIGATION ENDOWMENT

W. B. Camp, born South Carolinian and Clemson graduate, is a firm believer in irrigation for this part of the country and has endowed Clemson for the advancement of irrigation methods here. Mr. Camp is one of the big farmers of the world in California and Vice President of the United States Chamber of Commerce.

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The Men Who Guide Us . . .

James Aubrey Murphy, a recent graduate of Clemson College, is a prominent instructor in the Agricultural Engineering Department at Clemson. Mr. Murphy is a native of Anderson, South Carolina. He attended Clemson College and received his B.S. degree in June of 1955. He has been teaching five semesters, beginning in September of 1955. At the present time he is teaching Farm Machinery (Ag. En. 201) and Farm Equipment, a 202 course for Agricultural Engineers. While teaching, these two courses, he is working on his M.S. degree, which he plans to receive next summer.

James Aubrey Murphy

During the past two summers he has worked with the Horticulture Department in research on Aromatic tobacco. His work included making reports on his findings in this research.

While in college at Clemson, he was active in school organizations. He was an active member of Phi Eta Sigma, the freshman honorary fraternity for the entire college. In the School of Agriculture he was a member of Alpha Zeta. In his junior and senior year he was a member of Phi Kappa Phi, the honorary fraternity for the entire college. Mr. Murphy was active in the American Society of Agricultural Engineers, and he is Faculty Advisor for this organization at the present time.

Mr. Murphy lives in Anderson. He is married and has one child.

Dale Handlin

Professor Dale Handlin is a prominent figure in the Animal Husbandry Department here at Clemson. Professor Handlin was born in Geneses, Kansas, and received his B.S. degree in Animal Husbandry from Kansas State College in 1951. While at Kansas, he was a member of two winning livestock judging teams at the National Livestock Exposition in Chicago. In 1950 he was high scoring individual at the National Livestock Exposition.

Professor Handlin did graduate work at Texas A and M College where he received his M.S. degree in Animal Breeding in 1954. During these three years he coached the livestock judging team at Texas A and M College.

In 1954 he joined the Animal Husbandry Staff at Clemson College. Besides teaching, he is coaching the judging team and is in charge of swine. In 1954 his team was high in swine at the National Livestock Exposition and placed 15th in the contest. In 1957 the Clemson team won first place in the Spring Southeastern Livestock Judging Contest.

Professor Handlin is well known for his publication, **Livestock Judging Manual,** which is in great demand.

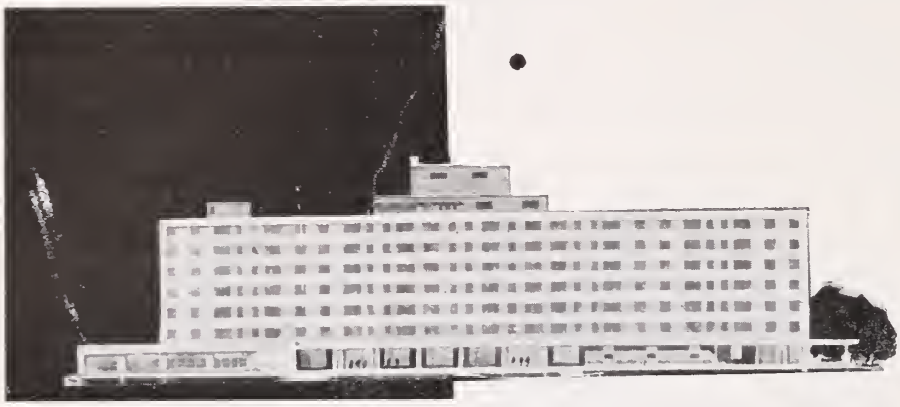
Professor Handlin is a member of the American Society of Animal Production, a member of the Clemson Jaycees, a member of the Fort Hill Presbyterian Church, and Faculty Advisor for the Block and Bridle Club.

Marlin H. Bruner

Professor Marlin H. Bruner is on the teaching staff in the Forestry Department for the first time this semester. Professor Bruner received his B.S. degree from Penn. State and his M.S. degree from the Yale School of Forestry.

Professor Bruner has had wide experience in his profession. He worked with the State of New Jersey Forestry Service. He did Extension Forestry work at the University of Arkansas in the years 1936-39 and was employed with Dupont in Public Relations for a number of years. In January of 1939, he came to Clemson to carry on the Extension Forestry work in the state of South Carolina. He was away from Clemson for a number of years on another job, but

(Continued on page 12)



Clemson House

AAA

In the foothills of the beautiful Blue Ridge Mountains, you'll find the Clemson House located in a unique setting — right on the campus of Clemson College. Here you will find all of the services of a great metropolitan hotel yet you will be far away from the noise of a large city. And you'll enjoy the beautifully landscaped grounds and the flower beds. The splendid accommodations and the excellent cuisine offered at the Clemson House are combined with warm friendly hospitality and fine service. The Clemson House is a gem among fine hotels, and the rates are almost unbelievably low. All rooms are air conditioned. Four dining rooms and the Tiger Lounge and Coffee Shop. There is swimming, fishing and golf nearby

FRED L. ZINK, JR., Manager

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ANDERSON FERTILIZER COMPANY
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MANUFACTURERS OF

SULFURIC ACID, SUPERPHOSPHATE

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COMPLETE FERTILIZERS

FOR HUNTERS ONLY

Have you seen the new duck stamp? It is a black and white wash drawing of several Canada geese feeding in a picked cornfield. This drawing by Leslie C. Kouba of Minneapolis was chosen for the 1958-59 season. A new duck stamp is issued each year by the Post Office Department, which is in charge of its distribution and sale. Every person over the age of 16 who hunts migratory waterfowl is required to have this stamp on his person while hunting.

More than two million duck stamps are sold annually. The revenue from the two dollar stamps is used to supplement other funds appropriated to the Fish and Wildlife Service for the purchase, development, administration, and maintenance of waterfowl refuges throughout the country.

* * * * *

Bobwhite quail hunters in the South may flush strange birds in front of their dogs this year. If a small bird resembling a cross between a meadow lark and a bobwhite quail bursts out of cover, it may be the Japanese Coturnix quail. Thousands of these birds have been imported from Asia and released in southern and midwestern states this year. Coturnix released in Tennessee last year were shot by hunters as far south as Florida. So keep your eyes open this season for the new "face" in the fields.

—G. S. Adams

BRUNER

(Continued from page 11)

he returned in January of 1954 at which time he began his new work in the management of the Clemson College land. Since the new course in Forestry has just started, he is teaching this semester to balance out the teaching load in the Forestry Department. At the present time he is teaching Farm Forestry (For. 205). His major interest at the present time is to find ways to bring about natural reproduction of Short Leaf Pine and Yellow Poplar.

As part of his service at Clemson, he has written several articles for leading farm and professional forestry magazines. He has written articles for the **Forest Farm** and **Journal of Forestry.** He is a member of several civic and professional organizations, including the Society of American Foresters Association, Forest Farmer, Friends of the Land, and the Fellowship Club of Clemson.

Peach Scab

By
F. B. Ashley, Hort. '58

The development of numerous brown freckle spots on peaches is the result of earlier infection by the fungus **Cladosporium** carpophilum. This fungus, causing the peach disease called scab, attacks peaches everywhere they are grown except in arid regions. It is favored by moist weather and moderate temperature during the growing season. It is more likely to be serious in low orchards having moist situations than in those having good air drainage. It affects the fruit, twigs, and occasionally the leaves, but is of economic importance only on the fruit.

Scab first appears on the fruit as pale green circular spots about one-sixteenth to one-eighth inch across, generally most numerous at the stem ends, but frequently scattered over the peach. They slowly enlarge and the color changes from green to dark brown then to almost black. These spots first become visible sixty days after the blossom petals have dropped. The fruit is about one-half grown at this time.

Scattered infections mar the appearance of the fruit but otherwise do little damage. Numerous infections, however, frequently coalesce, forming a dark crust-like growth that interferes with the normal swelling of the peach, causing it to crack as it ripens. Badly infected fruit is small and is readily infected by the brown rot fungus.

During the portion of the season before the fruit is harvested, the new twig growth remains smooth, but since spraying operations stop with the harvesting of the fruit, the new shoots are left unprotected during the rest of the season. By the time the leaves drop in the fall, the scab fungus develops on the undersurface of the leaves, forming irregular patches of brown growth. This phase of the disease is of no commercial importance.

The scab fungus grows very slowly and infections take place at least forty days before the spots become visible. Numerous experiments and many years of practical experience have been utilized in the control of scab. Bordeau mixture was first used as a spray to control peach scab but caused too much injury to the tree and the fruit. In 1907 a self-boiled lime sulfur mixture was used safely and was practical. One spraying of wettable sulfur, six to eight pounds per one-hundred gallons of water, will give almost perfect control of the disease on the fruit. However, due to environmental conditions fluctuating from season to season, it is conceivable that in some years conditions might be so favorable for scab development that as much as twelve pounds of sulfur per one-hundred gallons of water is necessary to give satisfactory peach scab control. Sprays should be applied with at least an average pressure of 200 pounds per square inch and one-half to four gallons of spray should be applied to each tree, of course, depending on their size.

A demonstration in 1917 proved that forty to sixty days lapse from the time spores infect the peach until the spots become visible. The timing of fungicide applications is of major importance, and sprays must be applied during the period of thirty to sixty days after petal fall or the fruit will become infected and develop spots. By following the South Carolina peach spray schedule this would mean a spray application at thirty, forty-five, and sixty days after petal fall. On varieties maturing later than Elberta a fourth application should be made seventy-two days after petal fall.

SOUTHERN BLUEBERRIES FOR HOME GARDENS

The southern highbush blueberry, commonly called "rabbiteye" blueberry, is highly recommended for the home garden. It is vigorous, drought and heat resistant, very productive and has a short rest-period which enables it to grow well anywhere in the state. Fifteen year old plants at Clemson are four to five times larger than northern highbush which are more exacting in cultural requirements.

This plant does well on an acid sandy or sandy loam soil of pH 4.5-5 5, rich in humus and of good fertility, well drained but retentive of moisture. Moisture appears to be the most limiting factor for success. The plant cannot stand waterlogged soils nor will it grow well in dry sandy soils of low humus content. The soils where it grows naturally are mostly of the Norfolk or related series, with much fine sand and a clay subsoil at one to four feet.

Better growth and yield will be obtained on relatively dry sites by mulching to a depth of 6-8 inches with straw, pine needles, or old sawdust. On the heavier upland soils of the Piedmont ,the plants appear to withstand less acid conditions and grow much better when mulched. A frost-pocket site should be avoided when possible.

On good sites a 10 x 10 foot spacing is best, especially with a high water table. An 8 x 8 foot spacing will do on drier soils, such as highland sites in the Piedmont. To maintain the desired acidity, a complete fertilizer of acid reaction should be used. An ounce per plant should be applied the year after setting out, and the amount increased gradually until the plants get about one-half of a pound annually. When nitrogen seems necessary, apply ammonium sulphate rather than sodium nitrate. The blueberry is shallow rooted and cannot stand deep cultivation.

The southern highbush blueberry can mature tremendous crops without pruning. Small bushy wood and dead or diseased branches should be cut out. As the plant gets older, new stems can be obtained by pruning back large old stems to a new shoot or shoots near the base of the old stem. Tall, erect-growing varieties may need cutting back to facilitate harvesting. Pruning to reduce the number of fruit buds usually results in the production of larger fruit.

Until 1950, all available varieties were selections from the wild. Since then several varieties have been developed by controlled breeding. At least two varieties should be planted to insure pollination and greater production. —H. J. Sefick

CLEMSON MILK

(Continued from page 3)

After the hot milk is homogenized it passes through the heat exchanger for pre-cooling with the cold raw milk and final cooling with ice water. Stainless steel plates keep the two liquids separated during this heat transfer. Upon the completion of pasteurization, homogenization, and cooling, the cold pasteurized milk is piped to sanitized ten gallon milk cans. These cans of milk are then delivered to the dining hall. The milk is poured into pitchers which the student waiters place on the tables. The next time you drink that glass of milk and call to the waiter for seconds, remember that this good milk does not just happen to be there.

GINNING

(Continued from page 7)

The opportunities for a person completing this program are very broad. At the present time there is a great shortage of qualified engineers in the cotton industry and there is no doubt that this shortage will continue to exist for some time. It is felt that this program will help to alleviate this shortage and that a person completing this program will be in a position to make a real contribution to the cotton industry.

WITCHWEED

(Continued from page 6)

However, about two-fifths of the infested area is found in peat-mucks.

Control

It is very important that all farmers be watchful for this plant parasite. Early detection is the most important step in control. If witchweed is suspected, the farmer should call his county agent or other agricultural agencies concerned to check his field. It is very necessary that the agent **come to the plant; the plants should not be taken to him** because, unintentionally, seed will be spread in the course of plant identification.

To help control the weed, the Crops Research Division of the Agricultural Research Service published a pamphlet (PA-331, USDA). This publication suggests the following control measures:

1. Notify your county agricultural agent if you find witchweed or suspect that a plant may be witchweed.

2. Do not move plants suspected of being witchweed. Request an on-the-farm identification from your county agent.

3. Do not plant corn, sugarcane, or sorghum on infested lands.

4. Adopt these crop rotation practices.

a. Plant wheat, oats, barley, or rye in the fall; follow then the practices recommended for your locality.

b. Follow these small grains the next year with either catch, or trap crops.

Use a true witchweed host such as Sudan grass as a catch crop. It secretes the chemical that causes the witchweed seeds to germinate and will support the parasite's growth. Planting and plowing under the host crop before the witchweed produces seed will reduce the weed seeds in infested fields.

Continue this practice as long as is necessary to deplete the soil of withweed seeds.

Use for trap crops plants that will cause witchweed seeds to germinate but are not true hosts. Cowpeas or soybeans, for example, will cause witchweed seeds to germinate, but they will not support the parasite's growth.

Trap crops should not be harvested on farms where witchweed is a severe problem unless the harvested crop is to be used in the infested area.

5. Kill crabgrass because it is a host of witchweed, as are some other grasses.

6. Treat non-cultivated lands infested with witchweeds and infestations found in cornfields with an herbicide, such as 2,4-D, to prevent flowering and seed production.

If crops susceptible to 2,4-D are nearby, the witchweed can be killed by spraying it with an herbicide such as DNBP in diesel oil.

7. Treat cultivated land where witchweed is noted for the first time, by either cultural or chemical means to destroy the pest.

8. Keep cotton, tobacco, peanuts, and sweet potatoes free of witchweed host plants such as crabgrass. These crop plants can be grown on witchweed infested lands so far as known now.

Only through the cooperation of the farmers, research workers, and all persons concerned, can this dread parasite be eradicated from American agriculture.

ABOUT THE COVER . . .

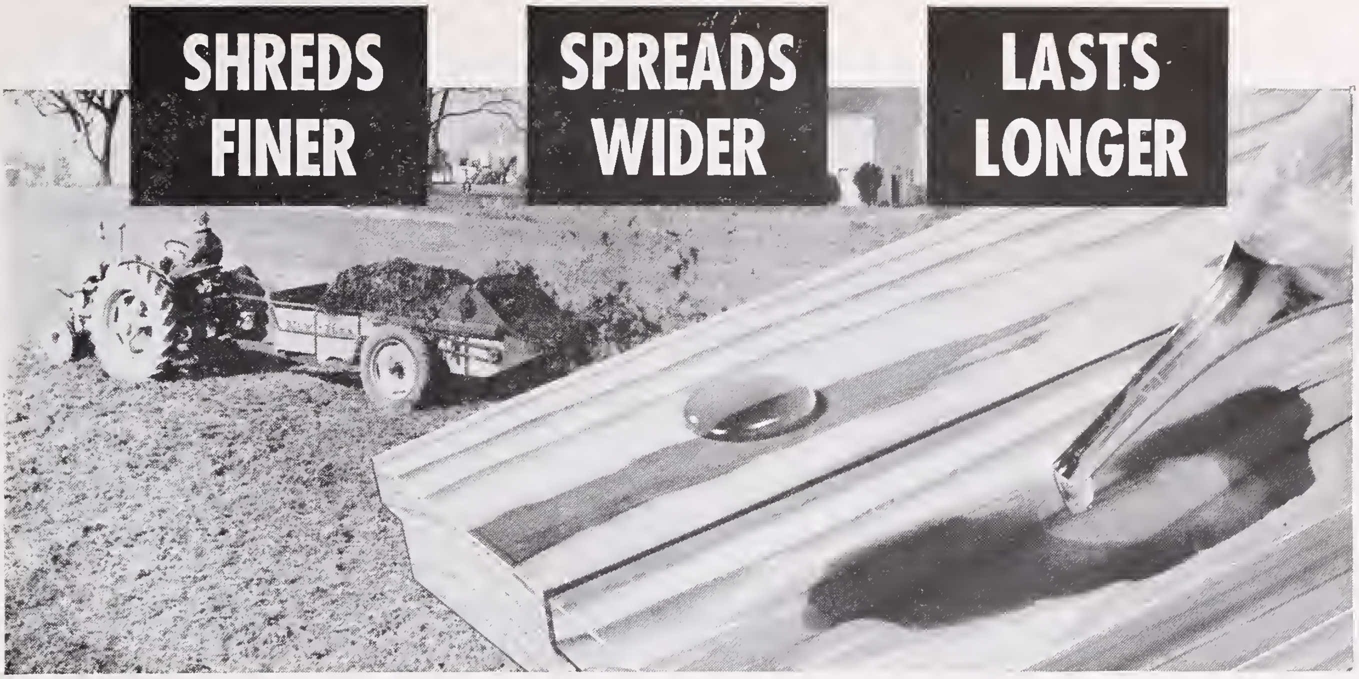
In the last decade a strong movement toward the restoration and the firing of muzzle loading rifles, shotguns, and pistols has taken place. Thousands of Americans hunt with these ancient weapons annually, and national matches are held annually at such places as Renfro Valley, Kentucky, and Waynesville, North Carolina. One of the most prominent of these is the North-South match, which pits the Rebel representatives against the Yankees. During this match many days are devoted to pistol and rifle matches, and even cannons get into the competition.

Black Powder and percussion caps have returned to the market again, and antique firearms firms have been flooded with orders for rifles in working condition. The demand has exceeded the supply to such an extent that many gunsmiths make new muzzle loaders on special orders.

Hunting with these old "bacon gitters" is a real challenge. Because of their low velocity, the shots have to be well placed in the most vulnerable spots. Nevertheless, these old pieces are much more accurate than one would imagine, but the knowledge that he has only one shot makes the hunter more careful.

There are several muzzle loading enthuiasts on the campus. Probably the most enthusiastic is Professor Robert Ware of the Zoology Department, who attends matches all over the south.

The next time you see a hunter with a long rifle, don't look at him as if he were crazy. He's just bringing back and almost forgotten art while he spends many pleasurable hours enjoying this increasingly popular sport. —G. S. Adams



One way New Idea adds years of spreading. At left, water stands on surface of water repellent Penta-treated board. At right, untreated board absorbs moisture. This New Idea treatment assures longer, rot-free life.

The Spreaders With Built-In Extra Years

Good reasons why successful farmers prefer **NEW IDEA** *spreaders*

For nearly sixty years, New Idea spreaders have been first choice of experienced farmers because they last longer, do the best job.

Last longer. Today, New Idea spreaders are built to rigid standards after being tested and re-tested to the breaking point on the New Idea torture track. On-farm testing proves both long life and performance. With New Idea spreaders, you have lower upkeep, many added years of spreading service.

Spread better. Every New Idea spreader shreds finer because the blade-like U-teeth are triple staggered to tear up the manure thoroughly. Famous New Idea replaceable paddles are scientifically designed to slice through manure and deliver a wider, more uniform pattern.

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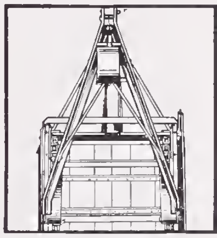
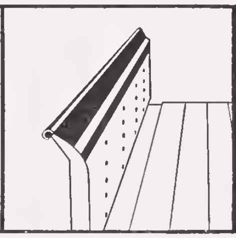
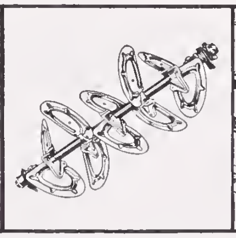


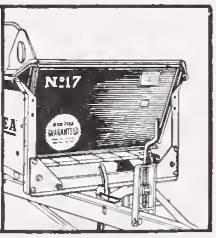
Extra years are added. Sturdy "A" hitch, of deep formed steel members extends back and ties into the main frame for extra stability.



Extra years of slam-bang loading. Heavy gauge steel flares strengthen box, withstand shocks of mechanical loading.



Extra years added to business end. Larger tubular distributor shaft is stronger and takes shock loads with less danger of damage.



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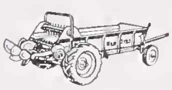

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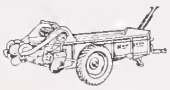

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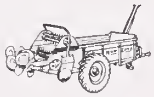

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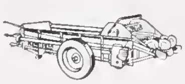

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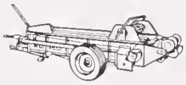

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☐ 75-bu. 4-wheel
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TALL CORN

A group of prohibitionists looking for evidence of the advantages of total abstinence were told of an old man of 102 who had never touched a drop of liquor. They rushed to his home to get a statement. After propping him up in bed and guiding his feeble hand along the dotted line, they heard a violent disturbance from the next room—furniture being broken, dishes being smashed, and the shuffling of feet. "Good heavens, what's that?" asked the visitors. "Oh," whispered the old man as he sank exhaustedly into his pillow, 'That's Pa drunk again."

* * * * *

He only drinks to calm himself
His steadiness to improve
Last night he got so steady
He couldn't even move.

* * * * *

Hall Counselor: 'Why didn't you scrape the mud off your shoes when you came in?

Animal Husbandry Student: 'What shoes?"

Favorite joke around the Civil Defense Department about the three sizes of hydrogen bombs: big, bigger, and "where is everybody?"

* * * * *

His companion bent over the dying man, to catch the last faintly whispered words. The utterance came with pitiful feebleness, yet with sufficient clearness: "I am dying—yes. Go to Fannie—Tell her—I died—with her name—on my lips—that I loved her—her alone—always . . . and Jennie—tell Jennie—the same thing."

* * * * *

Mary was complaining to Jim across the dinner table. "What a day," she said. "Baby got his first tooth, took his first step, fell, and knocked out his first tooth and then said his first word."

* * * * *

Then there was the time they crossed a rooster with a rooster, and you know what they got? A very cross rooster.

TOMORROW

He was going to be all that a mortal could be
Tomorrow.
None should be stronger or braver than he
Tomorrow.
A friend who was troubled and weary he knew
Who'd be glad of a lift and who needed it too;
On him he would call to see what he could do;
Tomorrow.
Each morning he stacked up the letters he'd write
Tomorrow.
And the thought of friends he would fill with delight
Tomorrow.
It was too bad indeed he was busy today
And hadn't a minute to stop on his way
"More time I'll give to others" he'd say—
Tomorrow.
The greatest of workers this man would have been
Tomorrow.
The world would have known him, had he ever seen
Tomorrow.
But the fact is, he died, and faded from view
And all that he left here when living was through
Was a mountain of things he intended to do—
Tomorrow.

An ashtray is the place where you put your butts when the room you're in doesn't have a floor."

* * * * *

Father to small boy dragging top half of Bikini suit along beach: "Now show Daddy exactly where you found it . . . '"

* * * * *

Mr. Finsnipper took his secretary, Miss DeMeanor, on a business trip involving an overnight train ride. She was in the upper berth he in the lower. He was almost asleep when she called down: "Mr. Finsnipper, do you have something to read? I'm having a hard time getting to sleep." He passed a magazine up to her.

Ten minutes later: "I'm sorry to disturb you, Mr. Finsnipper, but would you mind getting me a drink of water?"

"Miss DeMeanor," he replied softly suggestively, "would you like, just for this one night, to pretend you were Mrs. Finsnipper?"

"Yes, very much, Mr. Finsnipper."

"Fine," he bellowed. "Now get up and get your own damned drink of water."

* * * * *

A United Press dispatch from Milwaukee revealed this:

George Hauff, 69, boarded a streetcar on Tuesday morning without his pants.

Police who arrested him asked why he was riding around "on a streetcar on Tuesday morning without any pants on?"

"TUESDAY?" Hauff marveled. I thought it was Monday."

* * * * *

Pilot to tower, pilot to tower: plane out of gas; am one thousand feet and thirty miles over the ocean, what shall I do?"

Tower to pilot, tower to pilot: repeat after me . . . Our Father Who Art in Heaven . . . "

* * * * *

Forum: Twoum and twoum.

Nightcap: Something that went on Grandma's head instead of to it.

* * * * *

Lawyer: Why did you shoot your husband with a bow and arrow:

Defendant: I didn't want to wake the children.

And new 70-bushel McCormick No. 21 spreads this big load in a hurry, too! It rips hard-packed manure to pieces and spreads it uniformly. Treated wood box with steel flares and rugged frame for long life.

Quick drive-in mounting . . .

BIG LIFT at LOW COST

with the New McCormick® No. 33 Loader!

Ram-in loading—even with a 50 hp tractor—doesn't strain this new low-cost McCormick No. 33 loader. And all-welded frame, sturdy bracing, and closer-coupled, single-unit design also give the No. 33 loader strength to lift a ton nearly 10 feet high. Split-second control, 3,000-lb breakaway lift, and big 9-cubic-foot fork help you load 70 bushels in only 9 or 10 passes to cut manure moving time.

And you just drive in to mount the No. 33 loader in about 12 minutes. Parking legs, which hold the loader at proper height for fast mounting, become front braces. The rugged No. 33 loader mounts on International® 350 and 330 Utility tractors: Farmall 450, 350 and earlier models.

Save trips with new McCormick 95-bushel spreader. 108 self-cleaning beater teeth help new McCormick No. 30 spreader shred manure more thoroughly. Your choice of ground or pto drive.

Ask your IH dealer

to demonstrate McCormick No. 33 loader features that save time and work. Figure cash savings in first cost and operation that come with a McCormick loader and spreader that *exactly* fit your manure moving needs.

See your

INTERNATIONAL HARVESTER Dealer

International Harvester Products *pay for themselves* in use — Farm Tractors and Equipment . . . Twine . . . Commercial Wheel Tractors . . . Motor Trucks . . . Construction Equipment—General Office, Chicago 1, Illinois.

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when you switch to **WINSTON**

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The Agrarian

OFFICIAL STUDENT PUBLICATION

CLEMSON
MAR 26 1958
AGRI. REF. DEPT.

CLEMSON, S. C. THE CLEMSON A & M COLLEGE MARCH 1958

VOLUME XVII NUMBER 3

PERMIT NO. 4 — CLEMSON, S. C.
BULK RATE — U. S. POSTAGE PAID

JOHN DEERE Tractor Power *and*
New 6-ROW Equipment

It's here—a new way of farming that permits cotton farmers to meet and whip the bugaboos of bad weather, limited working time, and mounting labor and fuel costs by "going 6-row" with John Deere.

Now—with the eager, aggressive power of modern John Deere Tractors and the wide, hungry span of John Deere 6-Row Equipment—cotton farmers are right in the forefront of today's stepped-up farming pace. They can count on cutting fuel costs and working hours by as much as 1/3 and on increasing the efficiency of power and labor by as much as 50 per cent. And they are finding that it all shows up with a bigger figure on the profit side when tally is taken at the season's end.

It's Another John Deere First

The first in the field, the new John Deere line of 6-row equipment is a complete line which, for southland farmers, includes 6-row corn and cotton planters, 6-row bedders, and 6-row cultivators—each a part of the continued John Deere policy of "being there with the tools when they are needed"—each designed to carry on in the great tradition established in their John Deere 4-row counterparts.

Of course the big power and economy built into modern John Deere Tractors with the unmatched combination of modern features make them take naturally to 6-row farming, insure new savings in time, labor, and fuel for the farmer who "goes 6-row" with John Deere.

The John Deere 870 6-Row Bedder, shown here, "eats up the acres" with a broad, 6-row spread and leaves strip after strip of efficiently bedded or listed land behind.

The 684 Cotton and Corn Planter, shown here, does an accurate job of drilling or hill-dropping on flatland, on beds, or in furrows, planting six rows on every trip across the field.

JOHN DEERE

WHEREVER CROPS GROW, THERE'S A GROWING DEMAND FOR JOHN DEERE FARM EQUIPMENT"

The Agrarian

OFFICIAL STUDENT PUBLICATION

Volume XVII The Clemson Agricultural College Number 3

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THE COVER shows two Clemson landmarks—Tom Clemson and Tillman Hall.

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AGRARIAN PHILOSOPHY

Clemson's first college-wide open house program will be held on March 29 and 30. The School of Agriculture's part in this event will be extensive displays in the Plant and Animal Science, the Food Industry, and the Agricultural Engineering buildings. Every department will be represented by at least one display, and in most cases several exhibits are to be shown.

Personnel in the School of Agriculture have realized that the open house is a golden opportunity to show prospective students and other college visitors what the study of agriculture **really** is. There is a widespread misconception about agriculture and agricultural study. Many people picture agriculture as unrewarding, small-time farming, and the School of Agriculture as a type of trade school. Some of these same people can go to great lengths to prove that their beliefs are correct, for they aren't hampered by facts. Maybe I'm being a bit cynical, but the fact remains; a serious misconception does exist.

Actually, agriculture is our nation's basic industry. It is a challenging and complex science. Few prospective students realize that agriculture is a science; they also fail to realize that a college course in agriculture includes the application as well as the study of basic sciences such as chemistry, mathematics, and biology. As far as the School of Agriculture is concerned, the Open House will do much to destroy these misconceptions. Agriculture will be pictured as it is — an interesting and challenging science which deals primarily with living and growing things.

* * * *

This is the final issue for the present staff, and, as has been the custom in years past is the time for us to bow out as gracefully as possible. Working on the staff has, at times, been a trying experience but in the long run a rewarding one. Rewarding, not from the standpoint of recognition, but from the sense of accomplishment that comes with seeing the finished product.

Let's let that suffice as a farewell, and look for a moment at the future

(Continued on page 12)

SERVING THE FARMERS
IN NORTH AND SOUTH
CAROLINA SINCE 1906

PLANTERS
TRADE MARK
CORRECT PLANT FOOD

Planters
Fertilizer & Phosphate Co.

CHARLESTON, S. C. CHARLOTTE, N. C.

The Best Crop Insurance

CERTIFIED SEED

by
Thomas S. Harmon, Agron. '60

No longer must the farmer in South Carolina go to his barn early in the spring to select the seed he considers best for planting that year. Much better seed stock can now be obtained without any selection on the part of the farmer. All he needs to do is look for Blue Tag Certified Seed, and he is assured of good quality, high yielding seed. Thanks to the South Carolina Crop Improvement Association, farmers in South Carolina can purchase at a nominal cost seed of a known origin, guaranteed germination and purity, which are adapted to our climate and soils.

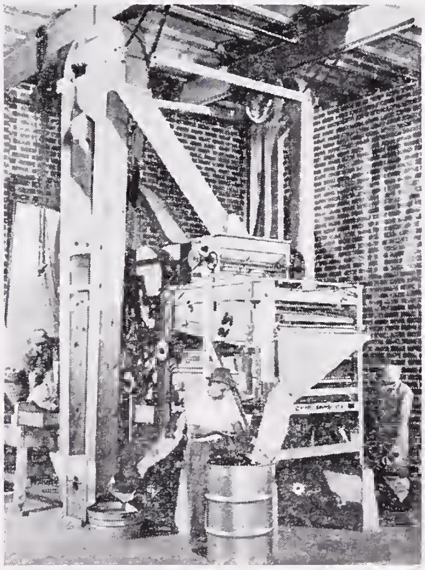
In 1946 the South Carolina Crop Improvement Association was formed to insure farmers of obtaining the highest quality seed and propagating materials. The Association is an agency chartered under the Corporation Law of the State of South Carolina and consistent with the 1945 Seed Improvement Act known as the Seed Certification Law. The headquarters for the Association are located at Clemson, and it is governed by a board of directors elected from and by the active membership. The board manages the association and makes any necessary changes in organization and operating procedure.

To attain the goal of furnishing high quality seed to South Carolina farmers, many steps are included in a time consuming process. Plant breeders in the Agronomy Department at Clemson, at the South Carolina Experiment Station, and employees of the USDA select individual plants for disease resistance, drought tolerance, and quality of product. Through many processes, the final product, Blue Tag Certified Seed for South Carolina farmers is produced.

To illustrate how certified seed are produced, let us take for example the Anderson variety of wheat. After outstanding individual plants are selected at the breeding stations, 1000 of the heads from plants having the most desirable characteristics are isolated to be planted. The objective at this point is not for high yields per acre, but for a rapid increase in the number of seeds. One head is planted to each row in the field. These rows will be harvested in the spring. Throughout the growing season constant checks are made to insure purity and quality. Some plots have been checked as many as 300 times. Records are kept and analyzed. Any row which is decidedly superior will be used and the remainder discarded. If no one row is superior, only the rows low in quality, if there are any, will be discarded, and the remainder will be kept as Breeders Seed. This process is used to further insure a high quality product.

The Breeders Seed are planted the following fall in 18 inch rows in a plot of about four acres. To give an idea of the increase in quantity, 50 pounds of seed were planted one year on the four acres. The resulting yield was 136 bushels. Only through proper care and cultivation was this possible. The product of this step in the process is known as Foundation Seed.

Up until this point all the work has been carried on directly by the Agronomy Department and the Seed Certification Department. However, the Foundation Seed are now contracted to farmers who are members of the South Carolina Foundation Seed Association. These growers plant and care for this wheat in the best manner and constantly rouge undesirable plants which may arise as a result of mutations. Weeds and other undesirable plants are also removed. The Seed Certification Department at Clemson inspects regularly to see that the specifications of the Foundation Seed Association are being met. The first seed produced from Foundation Seed are called Registered Seed.



Mr. Bob Garrison, Head of the Seed Certification Department, inspects the operation of this seed cleaning machine located on the experimental farm at Clemson. Cleaning is the final process in the production of high quality Blue Tag Certified Seed.

Registered Seed are then sold to members of the South Carolina Crop Improvement Association, who plant them to produce Blue Tag Certified Seed. This is the seed the farmer plants for commercial production. Throughout the growing season constant checks are made to insure the

(Continued on page 14)

54 YEARS OF SERVICE
TO SOUTHERN AGRICULTURE

"The South's Foremost
Seed Breeders"

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Research Farm at WHITESTONE

Mills Located At
SPARTANBURG and NEWBERRY

Clemson's Student Agricultural Council Is Organized

by

John Parris, VAE '58

The council's first slate of officers is (left to right): States McCarter, George W. Powell, Bruce Bate, and Gene Stembridge.

Another milestone in Clemson's agricultural progress has been realized with the organization of the STUDENT AGRICULTURAL COUNCIL. One of the important reasons for this council was to create a greater sense of pride and appreciation for agriculture in the minds of all students and faculty members. It is well known that the individual technical and special-interest clubs are doing a good job of stimulating interest and enthusiasm on the student's part, but the challenge of doing more through combined efforts is the council's aim. Out of the efforts of our agricultural clubs have come outstanding events like "Clemson's Little International" and South Carolina's first statewide "Rural Youngfolks Day". Among other things, THE AGRARIAN, which is the official agricultural student publication here at Clemson, has presented the achievements of each club. For all of these things we are glad, but can this agricultural council strengthen the efforts of each club? Actually, the function of this organization will be to unify and coordinate the activities of the various clubs for greater effectiveness.

The main objectives of the council shall be: 1. To serve as a sponsoring group for activities of interest to the whole School of Agriculture. 2. To serve in an advisory capacity to the Director of Agricultural Teaching and to the Dean of Agriculture concerning student problems. 3. To promote interest in agriculture among pre-college youth of this state. The council, which will be sponsoring activities of interest to everyone affiliated with agriculture, will include such events as the agricultural phase of Clemson's Open House on March 29th and 30th, 1958. In its advisory capacity, the Council will represent the agricultural students by presenting their problems and questions to the Director of Agricultural Teaching and the Dean of Agriculture. In this way the administration and faculty will be acquainted with the desires of the students. All in all, the council will strive to create a better student-teacher relationship. Then, in the interest of pre-college students, the organization will distribute guidance materials to all high schools, and in many cases agriculture students will visit in the schools. This one activity alone will serve to emphasize that agriculture is a science, and that a career in any one of the many fields of agriculture is a rewarding one. Also through the medium of radio and television, the council will present the tremendous work being done by the Clemson School of Agriculture in the realm of research and development, and especially in the training of hundreds of young men annually. These objectives will serve as a two-fold purpose by informing the public and providing the college student with new and exciting experiences.

The Council is composed of one representative from each of the technical and special-interest student clubs in the School of Agriculture. If a teaching department has no student club, the Head of that Department will designate a student to serve on the council. The representative of each club will be the President of the club. The officers and faculty advisers will be elected at the close of each academic year. The officers of the Council include a chairman, vice chairman, secretary-treasurer, reporter, and also a faculty adviser and assistant faculty adviser.

The officers who have been elected are:

Gene Stembridge	Chairman
George Powell	Vice Chairman
States McCarter	Sec.-Treas.
Bruce Bates	Reporter
Dr. W. B. Boykin	Faculty Adv.
Dr. J. T. Lazar	Asst Faculty Adv.

The regular meeting of the Council will be open to agricultural students and faculty.

The concept of an agriculture student council is not new—such councils are operating successfully in many colleges throughout the nation.

(Continued on page 14)

THE TRAINING OF A FORESTER

by
Garland Gravely, Forestry '59

In the field . . . . and in the lab.

A forester requires a broad education in the natural and social sciences as well as intensive training in his own special field. Entrance to a professional career depends upon such preparation. To become a successful forester a man must be able to express himself clearly and forcefully in written and spoken English, in simple mathematical language, and by means of sketches and drawings. Failure to acquire facility in expression is almost certain to be a handicap in the future. Written reports inform his superior of the work accomplished and supply the information upon which future plans are based.

Oral expression is indispensable to clear understanding and smooth relationships among people. Mathematical formulas are in almost constant use by foresters in their day-to-day jobs. Maps, graphs, pictorial charts, sketches of simple layouts for headquarter sites, recreation areas, and roads, plans for buildings, and designs for new equipment all require some facility in graphic expression.

A forester needs to understand fundamental laws. Forests are far more than land covered by trees. They involve the complete biologic, hydrologic, and edaphic complex that occupies the land. Unless a forester knows how earthworms, insects, other arthropods, fungi, and bacteria break down the forest litter and convert it into a life-supporting soil rich in humus, he lacks understanding of the key to forest productivity. Insects of both harmful and beneficial nature abound in the forest. Small mammals help in keeping insects under control but may also destroy tree seed and even girdle small trees. To manage this exceedingly complex biological community so as to harvest from it products useful to man with a minimum expenditure of money and effort is the forester's primary concern. It requires an understanding of the interrelationships between the various plants and animals that make up the forest community.

A forester needs basic knowledge of chemistry, physics, geology, and engineering. This helps him to understand this biologic community and to survey land, lay out and build roads, and erect buildings and observation towers. It also helps him to understand the principles of telephones, radios, internal-combustion engines, and the many types of equipment that are used in developing the forest and in harvesting and processing the forestry products.

The understanding of fundamental economics and business methods, government, and simple business law are the basis for operating a forest property economically. The major purpose of forestry is to provide for human needs. This must be guided by basic economic and business principles. A forester needs to understand elements of cost and to make appraisals of timber to be offered by sale. He should be able to understand simple balance sheets and earning statements, and know how to interpret and prepare budgets. He should have broad grasp of basic economics in order to understand the way in which forestry is related to the national economy as a whole. The management of land, the harvesting of timber, and the conversion of forest products into useful commodities involve operations affecting the economic welfare of communities as well as of individuals and companies. The forester is obliged to conduct his operations in conformity with federal and state laws governing use of land and employment of labor. To be successful, he must do more than to just stay within the law. He will seek to conduct his operations so as to strengthen his community and enlist the

(Continued on page 14)

The
Meat Type Hog

by W. C. Weeks, Jr.
A.H. '58

In recent years there has been a great deal of concern about the meat-type hog among swine breeders and producers. The reason for this concern was brought about by the increased production of vegetable fats, relatively low demand for lard, and by the constant demand of the housewife for lean pork. These factors have demanded of the swine industry a new concept in producing a leaner product.

Before emphasis was placed on the meat type hog, the American farmer was producing what was called the lard type-hog. This was a hog that was lacking in muscling and which produced considerable excess fat. At that time this type of hog was very desirable, for there was still a good market for lard, and little concern about lean meat.

Within the last five years, the demand for lard began to decrease and the American housewife became more interested in lean pork. The meat packing industry began to see that changes must be made. So, in order to get a hog that would dress out a higher percentage of lean cuts, the packers began to pay higher prices for hogs that would yield more lean. The different swine breed associations and agricultural colleges then began to see the need for a standard type of hog that would meet the demands of the consumer and be efficient to produce. In doing so, two different standards were established to guide the hog producer into the production of the meat type hog. These standards were production Registry and Meat-Type Certification.

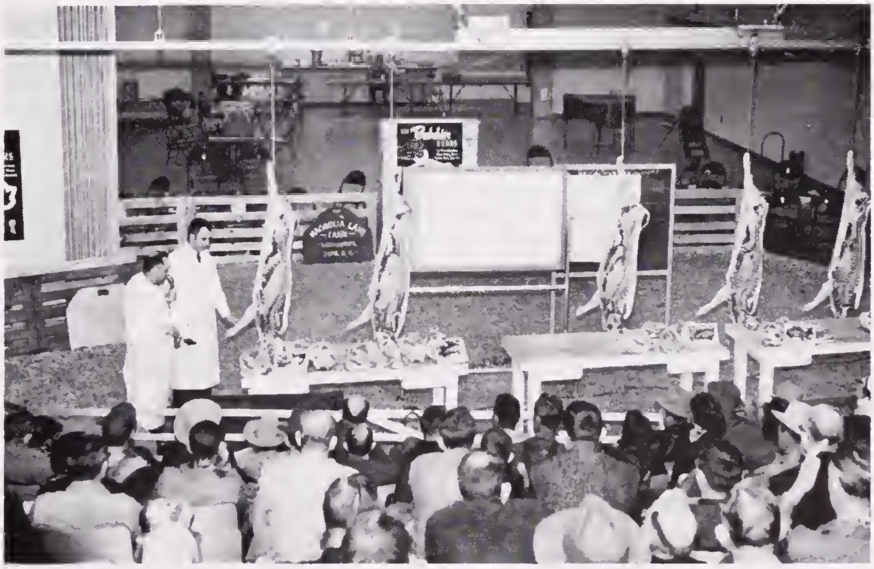
In order for a litter to be classified as a production registry litter, there are several requirements. First, within five days after a sow farrows, the breeder must submit to the breed association the name of the sire and dam, number of boar and gilt pigs in the litter, and the ear notch of each pig. In the Berkshire, Poland China, Chester White, and Yorkshire breeds, a gilt under 15 months of age must raise a litter of eight pigs to a 35 day weaning weight of over 152 pounds, except in the Berkshire breed, where the weaning weight must be over 144 pounds. In the Hampshire, Duroc, Landrace, and O.I.C. breeds a gilt under 15 months of age must raise a litter of eight pigs to a 56 day weaning weight of over 275 pounds. A sow must raise a litter of eight pigs to a 56 day weaning weight of over 320 pounds. In the Hampshire breed at least 50 percent of the pigs must be eligible for registration in the Hampshire Breed Association.

In order for a litter to be a certified meat type litter it must be a production registered litter, two pigs out of the litter must weigh 200 pounds at the age of or before six months.

Meat type hogs gain as rapidly or faster than average hogs. They can be produced at the same or less cost than fat type. Tests have shown that for each 1/10 inch less backfat, that it took four and one pounds less feed per 100 pounds of gain. In other words, it took 40 more pounds of feed to produce a 220 pound hog with 1.8 inches backfat compared to one with only 1.4 inches backfat. At present feed prices it would be about $1.40 cheaper to produce the leaner, meat-type hog. It is also necessary to understand that it takes two and a quarter times as much energy to produce a pound of fat than it does to produce one pound of lean meat.

Some people have thought that the solution to the problem could be found in the bacon type hog, but the producer cannot raise hogs for bacon alone. At the average wholesale

(Continued on page 14)



Berkshire breeders listen to an explanation of carcass grades at a recent Berkshire type conference which was held at Clemson.

BETWEEN T

Sowed by SA

FRESHMEN SCHOLARSHIPS

Thirteen Scholarships will be available to freshmen agriculture students in 1958-59. Scholarships are awarded on basis of the applicant's high school record, financial need and leadership. The score made on the entrance examination required of all freshmen entering Clemson College will also be considered.

Ten of the scholarships valued at $200 each are awarded on a state-wide basis by Sears-Roebuck Foundation. Smith-Douglass awards two four-year scholarships valued at $750 each. The remaining scholarship, which is valued at $300 per year, is contributed by G. H. Singleton.

Each recipient will be awarded the most desirable scholarship his qualifications merit.

"BUSY MAN"

Dr. Olen B. Garrison became the acting head of the Clemson Horticulture Department in February. He is director of the State Agriculture Experiment Station.

In December national colleagues of the Association of Land-Grant Colleges elected Dr. Garrison to the regional agricultural committee, the most influential within the organization. Comprised of nine top administrators, the committee oversees the use of all regional research funds in the entire field of agriculture.

Dr. Garrison is rightly called the "busy man" in South Carolina agriculture today.

FORESTRY STAFF

Dr. Bingham M. Cool and Charles Minor have recently joined The Clemson Department of Forestry faculty. Dr. Cool came to Clemson from Alabama Polytechnic Institute where he was Assistant Professor of Forestry. Minor has recently completed the basic requirements for his doctorate at Duke School of Forestry.

Professor Cool was born in West Pittston, Penn. He graduated from Louisiana State University, received his M.S. from Iowa State College, and his Ph.D. from Michigan State University.

Professor Minor is a native of Churdan, Iowa. He received his B.S. from Iowa State College, and his M.S. from the Duke School of Forestry.

Both men have practical experience in Southern forestry.

AGRONOMY CLUB NEWS

The Agronomy Club decided at a recent meeting to have a judging team from Clemson participate in the Regional Soil Judging Contest, which will be held at the University of Georgia in April. Soil judging will be a more advanced phase of classification than the land judging experienced in high school. Eight teams from six southeastern states plan to participate in this competition. The contest will be sponsored by the student activities section of the American Society of Agronomy.

The Agronomy recently held its annual election. Those elected to office were: Bruce Bates, President; Hugh Price, Vice President; R. H. Holstein, Secretary; Thomas S. Harmon, Jr., Treasurer; and Robert P. Rogers, Corresponding Secretary. Dr. W. B. Boykin was reelected faculty advisor.

The club held its initiation for the second semester on March 3. Club membership now totals over 20.

MILK CLINIC AND CONFERENCE

Laboratory test results of milk samples were tabulated and distributed at the Market Milk Clinic and Conference here in early February.

Milk samples were collected from plants, distribution and sales points in all areas of the state for testing by a Clemson clinic team.

Temperature when the sample is obtained, sediment, fat test, fill of container, coliform count, and flavor score were determined on each sample.

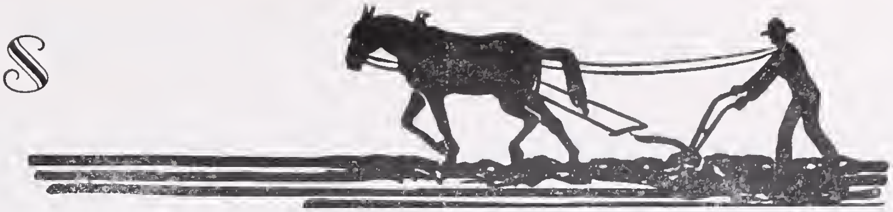
The Clemson testing team is comprised of D. M. Graham and J. T. Lazar, associate professors of dairying; C. B. Reeves, extension dairy technologist; and R. W. Henningson, assistant dairy scientist.

IFYE DELEGATE PRESENTS PROGRAM

The Clemson College 4-H Club was fortunate in having Gwen Atkinson as a guest speaker at a January meeting. Gwen has just returned from France after spending about five months as an International Farm Youth Exchange Delegate. She spoke of her experiences and showed slides of France. Gwen gave a very clear picture of the way the people live, their customs, and their agriculture. The objective of the IFYE program is to promote peace and better world understanding through youth exchange.

E FURROWS

LOWDEN



HORTICULTURE DELEGTE ATTEND CONVENTION

The Clemson Horticulture Department was well represented at the annual meeting of the Southern Region of the American Society of Horticultural Science. The society meets annually as a part of the Southern Agricultural Workers Convention. The meetings were held this year in Little Rock, Arkansas, on February 3, 4, and 5.

The local Horticulture Club, which is a member of the collegiate branch of the A.S.H.S., was represented by F. B. Ashley, James Blackwell, Marcus Howard, and Gene Stembridge. The teaching and research staffs were represented by Dr. Roy Ogle, Mr. H. A. Sefick, and Mr. L. O. Van Blaricom, all of whom presented technical papers. Ashley and Blackwell also presented papers at the collegiate branch meetings.

Delegates from six land-grant colleges in the South attended the collegiate meetings. A Clemson delegate, Marcus Howard, was elected Secretary of the Southern Region Collegiate Branch. Finances for Clemson collegiate delegates were made possible by various club projects

MUSSER RETIRES

Professor A. M. Musser, Head of the Horticulture Department since 1934, retired in January from 38 years of active service at Clemson College.

A native Pennsylvanian, Prof. Musser joined Clemson in 1919 as assistant extension horticulturist after serving as county agent in Clarendon County. In 1921 he became associate horticulturist of the South Carolina Experiment Station and in 1934 was elevated to department head. Professor Musser is a graduate of the University of Florida, and also studied at Penn State and Michigan State College.

His contributions in the peach development of South Carolina are held high in review. He is credited with most of the changes in styles for pruning peach trees, which encouraged growth of large trees and resulted in larger yields. He fostered a program in peach variety testing and maintained a constant interest in the processing of peaches. In other fields, he conduced important variety studies in fruits, nuts, and vegetables.

Prof. Musser is the author of many publications. Teaming with J. B. Edmond and F. S. Andrews, he authored the nationally-used college textbook, "Fundamentals of Horticulture."

Prof. Musser was honored in January by returning ex-students, associates and friends at a Clemson House dinner. He was presented with several gifts, and a book of letters from friends.

ENTOMOLOGY CLUB RESUMES ACTIVITIES

The Department of Entomology and Zoology announces that after a lapse of several years as a student club, the Clemson Entomology Club has resumed its activities as a functioning campus organization.

Membership is open to graduate and undergraduate majors in entomology or zoology and those non-majors interested in these fields. The club has been in the past, and will continue to be a regularly chartered student organization.

Provisional officers, until the first elections are held by the group, are John T. King, chairman, and Dr. Edwin W. King, acting faculty advisor.

DAIRY CLUB INSTALLS MILK VENDING MACHINE

The Dairy Club is rendering a service to students and employees at the Plant and Animal Science Building by operating a milk and candy vending machine. Prior to this installation, no facilities were available to the students for refreshments in this area. The students have found that a cold bottle of milk between classes and during laboratory breaks is very refreshing. This machine will enable the Dairy Club members to obtain valuable experience in this new field of milk merchandizing.

FORESTRY DEPARTMENT PROGRESSES

Clemson College's four-year forestry curriculum, established in September, is spurring new interest in forestry carees for South Carolina youth.

The new program provides in-state college training for the first time in the increasingly scientific field. Clemson converted from two-year pre-forestry courses this fall. Previously South Carolina students were forced outside the state to complete forestry work.

The initial effect on high school graduates is measured by Clemson's fall enrollment figures. Forty-four incoming freshmen enrolled, swelling the total of forestry majors to 75.

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The Men Who Guide Us . . .

Boyd J. Todd

One of the younger and more outstanding professors on our campus is Professor Boyd J. Todd, Associate Professor of Agricultural Economics. Mr. Todd is a 1946 Clemson College graduate, and he received his Masters degree from his alma mater in 1948.

After completing his graduate work, Mr. Todd served on the University of Georgia staff as assistant economist. He served in this capacity for several years, and then returned to the Clemson campus to the Agricultural Economics Department. At Clemson he established and carried on a research program in the field of marketing. Mr. Todd concentrated his work on the problem of determining the efficiency of the agricultural marketing system in our state with emphasis on the local assembly points of farmer's markets.

Professor Todd completed over two years of research work, and then began his present role as Associate Professor of Agriculture Economics. Specializing in agricultural marketing and statistics, he has taught for the past five years.

Mr. Todd is a Lieutenant in the Navy Reserve program, and he served on active duty during World War II. He is affiliated with the Clemson Methodist Church and is the faculty advisor of the Clemson Agricultural Economics Club.

Dr. John Millard Rush, Associate Professor of Bacteriology, is widely known on the Clemson Campus. Dr. Rush is a native of Lafayette, Indiana, where he grew up on a farm. After receiving his A.B. degree from Indiana University in 1928, he taught in the secondary schools of Illinois from 1929 to 1939. During this time he had received his M.S. degree at Illinois University in 1935. Dr. Rush then joined the Department of Biological Science at Purdue University where he taught General Biology and Bacteriology. While teaching at Purdue University, he worked on his Ph.D. degree which he received in 1947. During the war years, Dr. Rush helped train Navy technicians at Purdue University in the V-8 Program.

Since coming to Clemson, Dr. Rush has taught various Bacteriology courses. His interest is mainly taxonomy, and at present he is engaged in a taxonomic study of the Genus **Achromobacter.** He has come in contact with such public problems as water analysis, milk analysis and industry contamination problems.

Dr. Rush is a member of a Clemson College Committee working with the South Carolina Sewage Works Association in the preparation of a correspondence course for sewage and water works operators.

Dr. John Millard Rush

William Clayton Bowen

William Clayton Bowen, Associate Professor of Vocational Agricultural Education, is a well known figure in the School of Agriculture. Professor Bowen is a native of Pickens County. He received his B.S. degree from Clemson College in 1932. He did graduate work at Colorado State University, and he received his M.S. degree in 1940. Professor Bowen served four years with the U. S. Army, part of which was served in the Pacific during World War II. He is now a Lt. Colonel in the Army Reserves.

Professor Bowen does part-time work with the V.A.E. students at Clemson, and he devotes his other time to the training of vocational agriculture teachers in South Carolina. He has given aid in the preparation of teaching material used by agriculture teachers in the state.

When he was but 19 years of age, Professor Bowen began teaching in a small mountain school. Then he taught vocational agriculture at Pickens. Later, he taught at Central and served as assistant teacher in the V.A.E. Dept. at Clemson at the same time. He became a full-time Assistant Professor in 1937.

Professor Bowen has served as President of the Clemson Lions Club. He is a member of Alpha Tau Alpha, Gamma Sigma Delta, Alpha Zeta, and other organizations.

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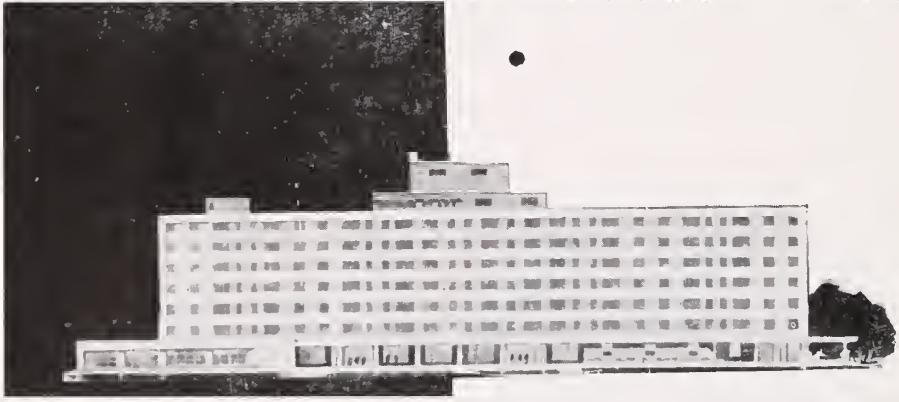


In the foothills of the beautiful Blue Ridge Mountains, you'll find the Clemson House located in a unique setting — right on the campus of Clemson College. Here you will find all of the services of a great metropolitan hotel yet you will be far away from the noise of a large city. And you'll enjoy the beautifully landscaped grounds and the flower beds. The splendid accommodations and the excellent cuisine offered at the Clemson House are combined with warm friendly hospitality and fine service. The Clemson House is a gem among fine hotels, and the rates are almost unbelievably low. All rooms are air conditioned. Four dining rooms and the Tiger Lounge and Coffee Shop. There is swimming, fishing and golf nearby

Clemson House

AAA

FRED L. ZINK, JR., Manager
On East Edge of Clemson, S. C., on U.S. 78, 123 and State 28.

AGRARIAN PHILOSOPHY

(Continued from page 1)

of the **Agrarian.** Our magazine's purpose is twofold: to disseminate information, and to create and develop interest in agriculture. The decreased enrollment in the School of Agriculture obligates the staff to publish somewhat more than just an acceptable magazine. It must be interesting and understandable to prospective as well as present students. To be perfectly immodest, I believe that the present staff has made progress in this direction, but there's still plenty of room for improvement. Rapid improvements could be made if more students would give **their** magazine more interest and support—not just cheers for the joke page, but enough interest in the purpose of the **Agrarian** to motivate them to offer their services as staff members.

A new staff will be in charge of the publication of the next issue. Give them your support—and watch the **Agrarian** grow!

—G. E. S.

Antibiotics

Better Poultry Nutrition

by
Charlie Toal, Poultry '59

A year'c egg production per hen is increased (basket on left) when antibiotics are fed. The basket on the right contains the eggs produced per hen in a flock which received no antibiotics.

One of the most spectacular developments in nutrition in recent years was the discovery that antibiotics have growth-stimulating properties when fed to chickens, turkeys, and swine. Few nutritional discoveries have been so quickly and universally applied to feeding practice.

Antibiotics are produced by the fermentation industry through the controlled growth of specific molds, yeasts, or bacteria. Such antibiotics as penicillin, aureomycin, terramycin, bacitracin, and streptomycin are available in suitable dilute pre-mixes for supplementing poultry rations. Combinations of several antibiotics in feeds do not seem to be more beneficial than when each was used alone.

Most investigators believe that the antibiotics exert their nutritional effect through changing the types and numbers of intestinal microorganisms. This might be accomplished by several means. One would be by suppression of inhibitory or "toxin-producing" microorganisms, or by the stimulation of microorganisms which manufacture known or unidentified vitamins which can subsequently be used by the host animal. Another method would be by the suppresion of microorganisms which compete with the host animal for certain essetial food nutrients. A final method would be by the suppression of 'disease" by eliminating pathogenic organisms from the intestinal tract. No single hypothesis seems to serve all cases, and it is not unlikely that several mechanisms may operate in various situations.

Feeding antibiotics will, under certain conditions, increase the rate of growth, improve the efficiency of feed, decrease mortality, shorten the feeding time to broiler weight, and improve coloring and feathering. Antibiotics may also make the flock develop more uniformly. An antibiotic feed supplement tends to increase appetite and feed consumption. It may also stimulate the pituitary gland, so that more growth hormone is produced. Possibly, an antibiotic supplement may increase the efficiency of the utilization of certain vitamins. Also, certain studies indicate that an antibiotic feed supplement may increase the assimilation of calcium. A change in bacterial population of the digestive tract might increase or decrease requirements for various nutrients since different species of bacteria differ in the extent to which they synthesize and utilize these nutrients.

It has been found that antibiotics added to laying rations do not necessarily improve fertility, egg weight, shell thickness, hatchability, the quality of the hatched chick, or egg production; however, in tests at several experiment stations, results in higher egg production have been recorded. In recent work at Clemson, antibiotics added to the ration of pullets naturally infected with chronic respiratory disease substantially increased egg production. The antibiotics used were aureomycin, penicillin, and terramycin. Mortality was decreased, and body weight was increased in these same tests.

In certain experiments chicks kept under normal growing conditions have responded much less, or not at all, to an antibiotic supplement. However, the growth stimulation on similar rations had been marked in preceeding broods. It is believed that this diference was due to a reduction of harmful bacteria brought by the continued use of an antibiotic supplement in the preceeding years. It is concluded by most workers that bacteria must be present in the environment or the feed for antibiotics to show their greatest effect.

Antibiotics are standard additions to certain commercial poultry feeds, especially starting, growing, and broiler feeds. While their effect apparently depends on a certain degree of contamination in the environment, these substances should not be con-

(Continued on page 16)

SEED CERTIFICATION

(Continued from page 3)

highest quality product. Any farmer, 4-H Club member, F.F.A. member, or any other person who is interested in making certified seed a part of his program may produce them, provided he meets the standards of the South Carolina Crop Improvements Association.

Many people may ask, "Why all this trouble to obtain seed? I can grow my own seed and save money." The cost of planting may be lower with the use of home-grown seed, but statistics have shown that the profits per acre will also be much lower than if the grower had used certified seed. Just as it is necessary to maintain good breeding lines in livestock, it is also necessary to maintain good lines of breeding in plants.

By tracing this process step by step, it is seen that five years are required to produce Blue Tag Certified Seed. However, the Blue Tag seed which are sold to farmers for commercial purposes are of the highest quality. With proper care these seed will insure increased yields on South Carolina farms.

One other class of seed may be grown for production as certified seed and are the first increase from the Blue Tag Seed. Green Tag Seed are ineligible for recertification but can be used by the commercial producer with as much success as Blue Tag seed.

The growth of seed certification in South Carolina has been quite rapid in recent years. In 1952, 14 different crops were listed as having certified producers. In 1956, 22 different crops were listed as having certified producers. The number of annual inspections has also risen continuously. However, there has been no increase in acreage planted to the production of certified crops. The factor probably accounting for this is the acreage controls on such crops as cotton.

A new variety of watermelons, the Garrisonian, and a new variety of cantaloupes, the Edisto, are two of the latest introductions through the seed certification program. A new variety of rye is still in the experimental stages. Other crops which have been recommended by the South Carolina Experiment Station are also available.

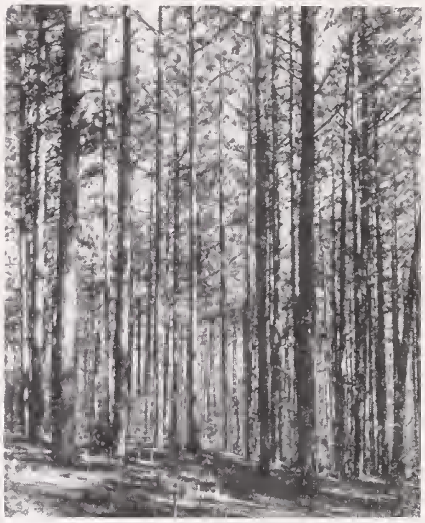
The South Carolina Crop Improvement Association is a member of the International Crop Improvement Association. It is noteworthy that the standards in South Carolina are higher than the minimum of the International Association.

Persons who are interested in the details of certified seed production should write to the South Carolina Crop Improvement Association, Clemson Agricultural College, Clemson, S. C.

FORESTER TRAINING

(Continued from page 6)

good will of citizens and government officials. By setting objectives acceptable to all men of good will and making these understood by all, he can help strengthen human cooperation in productive enterprise and free government.



Superior forests are a result of proper management.

Finally ,a forester must understand how to live and work with people. Forestry is to a large extent a public activity and almost every forester must deal with timberland owners, timber operators, employees, customers, and the citizen. Each forester should know something about administration, including the selection and training of personnel, the enlistment of public support for essential forestry measures, and how to draw forth collective opinion on community problems so as to enlist wholehearted cooperation in their solution. He should be aware of civic responsibilities and learn to live a happy and useful life.

The foregoing may be summed up by saying that a forester should have a good general education in the broad meaning of this term. It is especially important that he understand and deal effectively with himself, his fellowmen, the society of which he is a part, and the physical universe in which he lives. He is thereby prepared to live a productive life in harmony with his associates and environment.

MEAT-TYPE HOG

(Continued from page 7)

price at Chicago during 1956, packers received 40.2 cents per pound for trimmed hams while the price for bellies was 20.9 cents per pound. When a so-called bacon breed develops larger hams, shoulders, and loins along with bacon then it becomes a meat type hog.

In order for the farmer to produce meat type hogs, he must carefully select the boars and gilts to be used as his breeding stock. He should select hogs that are long bodied, trim about the head and jowl, firmly fleshed and which have a great deal of natural muscling. Other desirable characteristics are an even arch of back, length in the side, a moderate amount of thickness over the loin, and large, bulging hams. He should also select for breed type and sex character, and should strive to produce large litters that are ready for market in five to six months. Once the breeder has acquired these standards, he can be reasonably sure that he is well on the way to producing meat type hogs. He should remember, however, that only through constant selection and proper management can he be reasonably sure of top production of the right type of hog.

AG. COUNCIL

(Continued from page 5)

Their activities aren't all work and no play, either, for many sponsor such social projects as dances, agricultural school days, and picnics. **How strong the student agricultural council at Clemson will be depends entirely on student support. The students will determine the nature and success of its activities.**

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Here's a big farm tractor with a new feel of authority. You'll like its commanding all-new POWER-CRATER engine—its new comfort with center-ride seat, roomy platform, convenient new controls and instruments.

The new Power Director (The Big Stick) lets you select the right working speed without clutching or affecting PTO speed. The automatic TRACTION BOOSTER system provides the extra traction to get you through those tough places.

You'll want to see and try this *all-new* big Allis-Chalmers D-17, gasoline or diesel. Stop in at your Allis-Chalmers dealer.

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POWER DIRECTOR

THE "BIG STICK"

Quick-shift on-the-go in two speed ranges. Eight speeds forward. For power take-off operation, you can vary each speed for those tough or rough spots . . . yet retain constant live PTO speed.

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LOW-LINE HIGH-CROP design

The new D-17 and new D-14 span tall crops. New-type 4-row "swing-in" cultivators are mounted in an all-new way.

Both tractors have new Roll-Shift front wheels and Power-Shift rear wheels that space without a jack. SNAP-COUPLER hitch—of course!

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Overheard in an incubator: "Last one out is a rotten egg."

* * * * *

Mary had a little lamb
The lamb had halitosis
And every place that Mary went
The people held their nosis.

* * * * *

I think the Mormon prophet was
A very funny man
I wonder how his wives enjoyed
His prophet-sharing plan.

* * * * *

The FBI agent in a western state was hot on the trail of a fugitive. When word came that he was heading for a small Iowa town, the G-man called the local sheriff.

"You send me a pitcher of that guy and I'll git him good," the sheriff promised. That night the government agent mailed the sheriff not one, but a dozen pictures of the man—profiles, fullface, standing, sitting, and in various costumes. Within 24 hours, he received an electrifying phone call:

'We got 11 of those crooks locked up already," the sheriff boasted, "and I guarantee to jug the last one before morning."

* * * * *

Then there was the geologist who had the hobby of collecting stones and keeping them in his bathroom.

He had rocks in his head.

* * * * *

Looking down at the sick man the doctor decided to tell him the truth:

Doctor—I feel I should tell you that you are a very sick man. I'm sure that you would want to know the facts. Now—is there anyone you would like to see?

Bending down toward his patient the doctor heard him feebly answer:

Patient—Yes.

Doctor—Who is it?

Patient (in a stronger tone)—Another doctor.

* * * * *

"Not guilty of bigamy," said the judge. "You may go home."

"Thanks, judge. Which one?"

Moe: "Do you know what the man said when his cat got run over by a steam roller?"

Joe: "No."

Moe: "He didn't say anything—he just stood there with a long puss."

* * * * *

A young lover was reeling out a heavy line to impress the beautiful girl.

"Those soft lovely hands," he whispered.

"Your warm lips. And those beautiful eyes . . . Where did you get those eyes?"

She answered, "They came with my head."

* * * * *

It was 3 a.m. when he staggered home after a glorious evening. In a few minutes a series of unearthly squaks howled out of the radio. His wife looked into the room and discovered him frantically twisting the dial back and forth.

'For heaven's sake," she exclaimed. 'What in the devil are you doing."

"G'way, g'way! Don't bother me," he yelled. "Some poor devil's locked in the safe and I've forgot the combinashun."

* * * * *

Jimmy's mother, a believer in the be-a-little-gentleman-and-don't-fight school of upbringing, was trying to instill this noble outlook into her pugnacious son. "Jimmy, when that naughty boy threw stones at you, why didn't you come and tell me instead of throwing them back?"

"What good would that do?" snorted Jimmy. "You can't hit the side of a barn."

* * * * *

A sad tale is told of the glassblower who was suddenly gripped by an attack of hiccups. He turned out one thousand percolator caps before help came.

* * * * *

"Mommy, what's a vampire?"

"Shut up and drink your blood."

A frantic mother rushed into a doctor's office, dragging a five-year-old boy by the hand. "Doctor," she panted, "is this child capable of performing an appendectomy?"

"Of course not!" replied the startled medico.

"See!" screamed the mother to the boy. "Now you march right out of here and put it back."

* * * * *

"This is the third operating table this month, Dr. Polunger. You must learn not to cut so deeply."

* * * * *

Her lips quivered as they approached mine. My whole frame trembled as I looked into her eyes. Her body shook with intensity and our lips met, and my chin vibrated and my body shuddered as I held her to me.

Moral: Never kiss with the engine running.

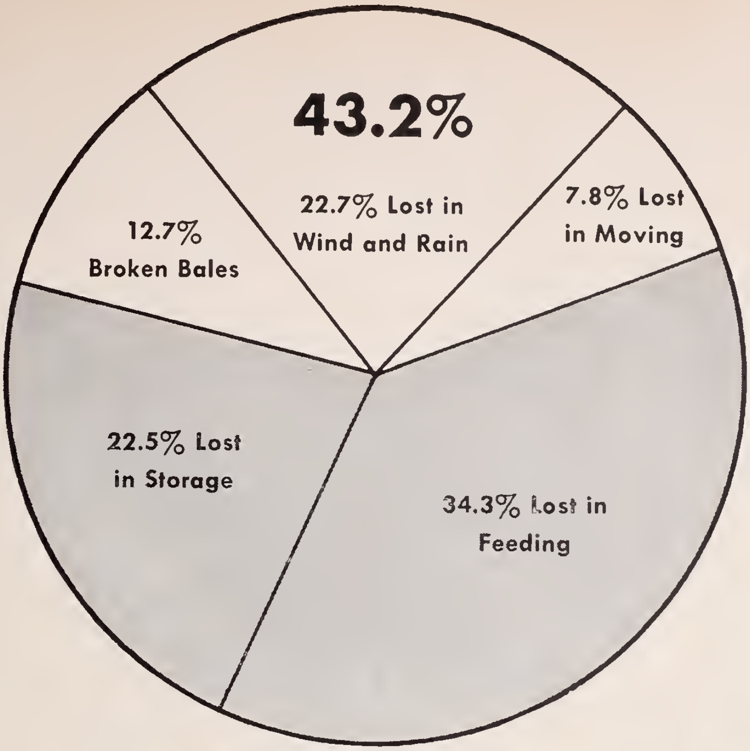
ANTIBIOTICS

(Continued from page 13)

sidered substitutes for proper sanitation. The amounts of antibiotics fed for growth stimulation are only a small fraction of the levels used for the treatment of disease. Low level feeding of antibiotics as practiced today consists of adding two to ten grams per ton of feed.

Recent studies at Clemson with layers have shown that adding 50 grams of either aureomycin or terramycin per ton of feed was an economical and sound practice. Feeding 100 or more grams of antibiotics per ton of feed is generally referred to as a therapeutic level. This is generally practiced with birds that are affected with disease.

There are yet to be evaluated thousands of chemicals and drugs which may effect in some way the microorganisms in the intestines and thus improve nutrition of poultry. It is expected that there will be much active research in this field in the future.



AG COLLEGE SURVEY SHOWS 43.2% OF HAY LOSSES OCCUR IN HARVESTING

From Circular 203, Montana State College Agricultural Experiment Station.

YOU SAVE "LOST HAY" 3 WAYS

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The Agrarian

OFFICIAL STUDENT PUBLICATION

CLEMSON, S. C. THE CLEMSON A & M COLLEGE MAY 1958

VOLUME XVII NUMBER 4

PERMIT NO. 4 — CLEMSON, S. C.
BULK RATE — U. S. POSTAGE PAID

There are plans that I must draw.

Then let this timid hand of mine
Be guided, line for line,
With that steady, certain trueness
Of the Hand that planned
This universe.

There are materials I must choose.

Then let this casual mind of mine
Choose with the wisdom of the Mind
That fixed the substances
Of things like grass and trees
And mountain peaks.

There are decisions I must make.

Then let me make them with that sureness
That divided land and sea,
And day and night, the birds that fly
And beasts that roam the field.

I've a future I must build

There's a determination I must have.

Then let me bind myself unto such things
As principles, and truth, and right
With that same permanence
That holds in their celestial places
The sun, and stars,
And all the heavens' gems.

I've a future I must build.

So, let me build it with such care,
Such tools, such wisdom,
And with such a rugged firmness,
That all the fiercest thrusts
Of host or elements
Cannot destroy it.

Aye, I've a future I must build . . .
Let me rise, then, to the task!

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The Agrarian

OFFICIAL STUDENT PUBLICATION

Volume XVII The Clemson Agricultural College Number 4

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Between the Furrows page 8
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Tall Corn page 16

THE COVER: This is certainly a lucky sheep being held by Miss Mary McCallister from Fort Mill. S. C.

THE AGRARIAN—published in November, January, March and May by the undergraduate students in the School of Agriculture and sponsored by the South Carolina chapter of Alpha Zeta. Opinions expressed in this magazine do not necessarily reflect the policy of the School of Agriculture or Clemson College.

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AGRARIAN PHILOSOPHY

We, the members of this year's staff of the Agrarian, realize that we have a difficult and challenging task before us. We hope to keep up the good work of the past editors who have continually built it up to a top publication. It is going to be hard work to improve upon their work. It is evident to us that we can accomplish little or nothing without the support of the students and faculty members in the School of Agriculture. You may say "what can I do to help **our** publication?" I hope you say **our** publication because it is **your** publication. If you would like to help with the **Agrarian,** we are always in need of interesting articles—articles that will be of some interest and service to stuworkers in the state. If you have an dents, farmers, and agricultural article you think would be of interest, contact any member of the staff.

What does the new staff plan to accomplish this year and next year? As the editors have done in the past, we want to convey to the readers of this publication the important developments in the ever enlarging field of agriculture. We want to create more interest and enthusiasm in agriculture among the students by showing them some of the things that are going on right here on the campus.

* * * * *

"Clemesta" is over, and many students might wonder if it was worth the long hours of planning, preparation, and work it required. Although the attendance at "Clemesta" might not have been up to expectations, the School of Agriculture should feel justly proud of the many fine exhibits that were on display. "Clemesta" not only helped to convey to the visitors the idea that agriculture is a science, business, and industry; but it gave our own students in agriculture a feeling of pride in what we have and the accomplishments we have made. It is certainly pleasing to know that the School of Agriculture is definitely on the move this year. Many of our visitors who had the feeling that they knew all about agriculture when they walked into the entrance of the Plant and Animal Science Building were soon to find that agriculture is more than "plowing a mule" or "milking a cow." "Clemesta" gave the visitors

(Continued on page 16)

SERVING THE FARMERS
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Clemson Little International

By W. C. Weeks, A.H. '58

The Second Annual Clemson Little International was held on Saturday, April 19, 1958. This event is a livestock showmanship and judging contest sponsored by the Block and Bridle Club in conjunction with the Animal Husbandry Department. The showmanship contest is designed to give each member of the Club experience in fitting and showing different classes of livestock. The judging contest is extended to all F.F.A. and 4-H judging teams in the state, and is designed to give them practice in judging livestock. The judging contest is also open to college students majoring in agriculture who are interested in livestock judging.

Prof. Dale Handlin and J. R. Hill look over the awards.

The program, which ran for the entire day, included the showing of sheep, swine, and cattle. These groups of livestock were divided into classes. The sheep were divided into classes of crossbred lambs and Hampsire rams; the swine were divided into classes of Hampshire gilts and Berkshire gilts; and the cattle were divided into classes of crossbred fat steers, Aberdeen Angus heifers, and Polled Hereford heifers. The culmination of these events for each group of livestock was the crowning of a Grand Champion and Reserve Grand Champion Showman.

The results of these contests ran as follows: First and Second Places in the sheep department were taken by W. C. Weeks, showing a Hampshire ram, and C. A. Segars, with a crossbred lamb. In the swine department, T. N. Rogers, showing a Hampshire gilt, and R. C. Sherard, with a Berkshire gilt were First and Second Place Showman Winners. First and Second Place in the cattle department were T. W. Hayes and H. D. Goforth, both with crossbred fat steers. When the individual champion from each class had been chosen, he competed to become the Grand Champion of the entire Showmanship Contest. W. C. Weeks, showing a Hampshire ram, was named the Grand Champion Showman and T. N. Rogers, showing a Hampshire gilt, was named the Reserve Grand Champion Showman.

All awards and ribbons were presented to the winners by "Miss Little International", Miss Mary McCallister, a student at Winthrop College, from Fort Mill, S. C. These ribbons were made of leather, being the first time that leather ribbons have ever been given in a contest in the Southeast.

The judges for the Contest were E. W. Cook of Clemson, sheep; Pete Mahler, Chinquapin Farms, Tryon, N. C., swine; and R. C. McCants, Jr., Master Feed and Grain Co., Orangeburg, cattle.

At 1:00 p.m. the F.F.A., the 4-H and the College Freshman Judging Contests were held. The F.F.A. and 4-H Teams competed on team as well as individual basis with the first five individuals receiving leather ribbons and the first two teams receiving cups and plaques. In 4-H competition the Sumter team was the winning team with Bobby Powell taking top honors as high scorer. In the F. F. A. Contest, the J. F. Byrnes team won, and Ronald Knight was high scorer. The college freshmen competed on an individual basis and were awarded keys and ribbons. Jack Martin was high scorer in the Freshman Contest and Walter Pitts was Second Place Winner. Eight classes were judged in the contest, with the F. F. A. and 4-H Team only placing each class, while the College Freshmen placed each class and gave two sets of reasons for their placings.

At 7:00 p.m. the Annual Club Banquet, the last event of the day, was held at the Clemson House. After a fine steak dinner, the Club was addressed by Mr. T. E. Bell of Orangeburg, a Clemson graduate and now Head Buyer for Kingan Packing Company of that city. Mr. Bell spoke on "Changes and Challenges Facing Students Majoring in Animal Husbandry," and stressed the importance of developing and maintaining quality in the livestock produced in South Carolina. After Mr. Bell's talk, the awards of the different events of the day and year were made to the members of the Club.

Reserve Grand Champion Showman T. N. Rogers shows off a gilt.

Trays were presented to the Grand Champion and Reserve Grand Champion Showman in the Showmanship Contest. The presentation was made by Professor D. L. Handlin, Faculty Advisor for the Club. The winner and runner-up of the Freshmen Judging Contest were given keys by W. C. Weeks. President Weeks then presented the lovely queen with a silver cup. The Judging Team was presented medals by their coach, D. L. Handlin, and the team in turn gave Mr. Handlin a sterling silver inscribed dish. The top honor given by the Block and Bridle Club, the Merit Trophy Award, was presented to the most outstanding senior, W. C. Weeks, by Dr. R. F. Wheeler, Head of the Animal Husbandry Department.

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Beekeeping in South Carolina

By Rhemar P. Lane, Ag. Ec. '58

In our new and modern agricultural economy in South Carolina, diversification is a must when possible. Bees can be handled by most members of the family, and all phases of beekeeping may be more than an interesting hobby. With proper management, beekeeping can result in a highly profitable enterprise.

The honey bee was introduced into North America in Colonial times. Since then it has been distributed widely across the continent. The German or black bee, the Carniolan or striped bee, the Caucasian, and the Italian or amber bee, are varieties of the same species. The Italian race is most valued by beekeepers. Even more important than the beeswax or the honey produced is the service bees render farmers. Much of the plant world is dependent to a large extent upon the bee for its pollination. South Carolina is a favorable location for beekeeping. The Palmetto state has ample flowering plants which will produce some of the most desirable honey known in the whole country. Some of these plants include the huckleberry, asters, the gums, soy beans, cotton, hairy vetch, the clovers, sour wood, peach and apples; to mention only a few of them. Other conditions favorable for beekeeping in South Carolina are ideal climate and good soil types, as well as the numerous streams and swamps located throughout the state.

The art of beekeeping is not confined to honey production. One may specialize in queen bee rearing. Another desirable phase of beekeeping is the production of package bees. In fact, the greatest bee packaging area is the South. Recently, many beekeepers have made a specialty of producing royal jelly, and high profits have been realized from this endeavor. Also, not new in the bee business at all, are the producers who rent or hire out their hives to orchard farmers and others who desire bees for pollination of special plants.

Carrying out one of the jobs involved with beekeeping.

Although many recent publications about beekeeping indicate that South Carolina has been increasing percentage wise in the number of colonies of bees, we should stop and think of where we were on the production scale in earlier years. Even the number of hives has been decreasing for the past few years. In 1900 South Carolina had approximately 150,000 colonies of bees compared to about 60,000 colonies in 1954. In 1958 the number of colonies had probably dropped to approximately 58,000, and the number of producers has been on the decline for several years.

In analyzing the situation, one may conclude quickly that the decline is due basically to the small net profit for the beekeepers' efforts. A further analysis, however, may throw a somewhat different light on the subject. The net profit per pound of honey is much less with the producers who are using outdated equipment, and, in general, have a poor knowledge of beekeeping. This fact added to the lack of good advertising has kept many beekeepers in a poor financial status. In other words, the fixed costs involved for the inefficient producer are as great as they are for the efficient producer. This established fixed cost necessitates a much smaller net profit per pound of honey for the inefficient beekeeper.

One other managerial problem which the beekeeper encounters is the practice of feeding bees artificially. The bees live through the winter in the hive, and it is their nature to eat the honey which they have stored in the honeycomb cells during the summer. If excessive amounts of honey were removed from the hives during the harvesting season, however, there is no natural food for the bees. When this situation occurs, the bees must be fed or they will starve. In South Carolina the most critical time requiring close observation of the bees' honey stores is from late March to middle or late

(Continued on page 12)

Clemesta - 1958

This information booth operated by Alpha Zeta was the beginning of the long route through "Clemesta."

AGRICULTURAL ECONOMICS

By John L. Williams, Ag. Ec. '59

Our Agricultural Economics display for "Clemesta" was designed to give other people an idea of the subjects we study here at Clemson and the various job opportunities available for Agricultural Economics graduates.

At the center of our display, we had an arch representing a door, and from this arch there was a rotating electrical sign reading, "Welcome to Agricultural Economics." To the left and right of the arch we divided our curriculum into the courses taught in the Department—Agricultural Marketing, Agricultural Policy, Farm Management, Rural Sociology, Agricultural Cooperatives, and Statistics.

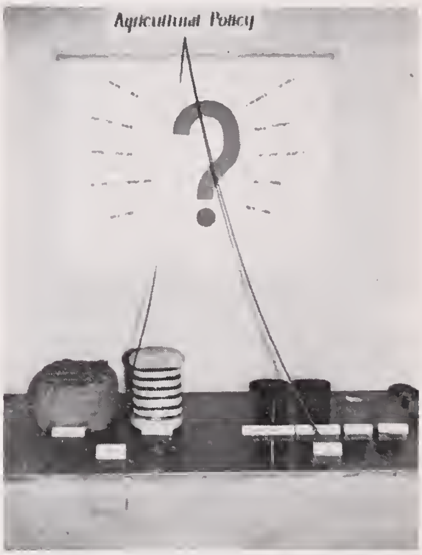
Transportation, Storage, Packaging, and Market Research made up the functions of the Marketing display. All of the functions were represented by models except Market Research, which was well illustrated by an improved type of fruit facer. This new facer has been developed as a result of a study made by the Agricultural Economics Department. This improved type facer is designed so that the person doing the facing may have both hands free to select the fruit for the facer, and this greatly reduces the time required to do the job.

Our Agricultural Policy display tried to bring out the fact that the United States must maintain foreign markets for Agricultural products if she plans to maintain and increase the prosperity of Agriculture. The question was also raised as to whether Agriculture is better off with government support or without government support. This is a question that can be debated for many hours by farmers and other people.

A balanced farm program was the theme of the Farm Management display. Every farm in the United States must strive to have a well-balanced farm program if farm families as a whole wish to raise their level of living. If we are to have an efficient, well-balanced farm program, we must have efficient management, keep adequate records, plant recommended varieties, and follow recommended soil conservation practices.

Rural Sociology was very aptly illustrated by pictures showing the various farm and home improvements that one can make to increase the attractiveness of his own farm as well as the community's appearance. We may need to paint the house, repair and paint the mailbox, or replace a fence that is falling down. We can also build a community center so that the farm families will have a place to gather and have socials. Things such as those mentioned above may also increase the value of the community or neighborhood.

Agricultural Cooperatives were represented by a display of a milk cooperative. We tried to point out how a farmer might be able to market his products better through a cooperative. Farmers marketing cooperatively have had by far the greatest influence on market organization and prices. The basic objective of the cooperatives has been to bring greater returns to farmers for the products they sell.



"Should We Have Government Support?" was the theme of this exhibit.

Statistics is a subject we hear much of and come in contact with regularly, yet we know little about it. Our exhibit was designed to show the tools students work with and a few of the things that may be accomplished by statistical methods. One of the tools used most frequently is the calculator, which was displayed with a mannequin standing over it as if he were going to do some calculating.

In ending, I would like to thank all of those who contributed so much of their time and talent to make our Agricultural Economics exhibit a success.

AGRICULTURAL ENGINEERING

James K. Merck, Ag. En

The profession of Agricultural Engineering is usually divided into four major fields as follows: Soil and Water, Farm Structures, Farm Machinery, and Electric Power and Processing. The Agricultural Engineering Clemesta program was arranged with displays on each of the above with special exhibits on Ginning Engineering.

The Soil and Water display, which won the blue ribbon for best individual display in the School of Agriculture, consisted of a model of an ideal farm layout on a large sand table. The proper installation of tile drainage systems, terraces, grassed waterways, and plastic lined ponds were but a few of the many engineering features shown. A bit of humor was added by special installations exhibited in the edge of the forest.

On an adjoining table, a person could observe the four ways of installing drain tile. These were classed as Not Permissible, Ordinary, First Class and Concrete Cradle.

The Farm Structures exhibit contained models of two pole-type general purpose farm structures along with a display of split ring connectors. A four hundred pound load was supported by a model truss, constructed of southern pine members, ½ by 1 inch in size. This model truss clearly demonstrated the need for proper design in farm structures.

Exhibits in another important phase of Agricultural Engineering, Electric Power and Processing, included a motor and control test stand and a water pump test stand. Various instruments used in research and teaching were displayed. Included in these was a sixteen point temperature recorder which records the temperature in sixteen pre-determined locations at one time.

The Farm Machinery displays presented a contrast between old and new machinery. An old hand-operated cotton gin and a modern power driven gin were displayed along with a modern cotton picker. An early model of a cotton stripper, made in York County, South Carolina, was included in the many pieces of farm machinery.

A combine equipped with a corn harvesting attachment was a direct contrast to a replica of Cyrus Hall McCormick's first reaper. Old and new tillage equipment was exhibited on the outside of the building. "Spotlighting" grassland farming were bailers.

A special exhibit of Agricultural Engineering that was of interest to many in the cotton belt was the display of Ginning Engineering at Clemson. This display had several cut-a-way views of equipment used in a modern cotton gin and samples of the cotton and trash at each point in the ginning process.

AGRONOMY

By Richard Holstein, Agron. '59

For their exhibit in Clemesta, the Agronomy Club members emphasized the importance of soils, proper fertilization, and improved varieties to South Carolina agriculture.

Among the exhibits was a comparason of the productivity of Common and Coastal Bermuda Grass. The exhibit showed the result of the grass's reaction to irrigation and different amounts of nitrogen. Exhibits of cotton and corn were shown which illustrated the differences in yields due to irrigation. It was found that the gross returns from an acre of cotton increased from $184 per acre to almost $484 per acre with the use of irrigation. Likewise, the yield of corn was increased from 12 bushels per acre to 117 bushels per acre with proper irrigation.

On the soils side an exhibit was presented which showed the geological evolution of soils from their parent material country rock. The soil was then broken down to show the component parts. Nematodes, which may be either helpful or harmful, were shown along with benefits and damages which they cause. Sands, silt and clay were displayed along with the percentages of each which make up common soil types.

Dr. W. B. Boykin and Mr. Ben Eskew were advisors for the club presentation. They were assisted in the planning by Bruce Bates, Robert Stephens, Dewitt Walker, Tom Harmon, Jr., and Dick Holstein.

POULTRY

By Charlie Toal, Poultry '59

For "Clemesta" the Poultry Department showed off the dressing plant from start to finish. The processing plant is considered to be the most modern of all pilot dressing plants in the agricultural colleges of the United States. The dressing plant has a maximum capacity of 1000 birds an hour, and requires 20 persons to operate at full capacity. As the birds are brought by truck to the plant, they are put on the continuous line and are killed with an electric stunning knife. The knife cuts the large blood vessel in the neck and shocks or stuns at the same time. The birds then go to the scalder with water at 128°F, and this loosens the feathers for the first picker. This picker picks the main feathers by the action of rubber fin-

(Continued on page 12)

South Carolina crops were featured in one phase of the Agronomy exhibit.

BETWEEN

Sowed by BI

ALPHA ZETA ELECTS NEW MEMBERS

Alpha Zeta is a national organization which proposes to "promote the profession of agriculture; to establish, foster, and develop high standards of scholarship, character, leadership, and a spirit of fellowship among all its members; to create and band together a body of outstanding technical men who by scholarly attainment, a faithful service, and maintenance of ethical ideals and principals have achieved distinction and are capable of honoring achievement in others; to strive for breadth of vision, unity of action and accomplishment of ideals; to commend all worthy deeds, and if fraternal welfare demands, to counsel with its members."

Alpha Zeta members are selected from agricultural students "of high scholarship on the basis of character, leadership, and personality." This semester nine new members were received. They are as follows: Neil H. Anderson, Greenville; Robert B. Dibble, Orangeburg; Thomas S. Harmon, Jr., Lexington; Donald W. Eaddy, Lake City; Elbert D. Porter, Loris; Donald R. Gowan, Inman; Michael Mangum, Spartanburg; John G. Swartzfager, Columbia; and William C. Mills, Blackstock. Dr. Koloman Lehotsky, Forestry Department head, was taken in as an associate member.

Alpha Zeta officers and advisors were elected at the regular meeting on April 14. The officers are as follows:

States M. McCarter	Chancellor
Thomas S. Harmon, Jr.	Censor
Billy R. Abercrombie	Scribe
H. Todd Arant	Treasurer
Rufus C. Sherard	Chronicler

L. M. Bauknight, Jr., associate professor of Agricultural Economics, was elected as advisor to serve in the place of Dr. L. D. Malphrus, whose term expired. Other members of the advisory committee are Dr. W. M. Epps, Chairman and Dr. G. R. Craddock.

The National Conclave will be held at the University of Kentucky in September, and Billy R. Abercrombie was elected delegate and States M. McCarter as alternate from the South Carolina Chapter.

Other business consisted of planning for the annual Alpha Zeta banquet to be held May 5th at the Clemson House.

New Alpha Zeta members smile at the informal initiation

F.F.A. ELECTS OFFICERS

The Clemson Collegiate Chapter of the Future Farmers of America recently elected three members to fill those vacancies made by seniors going out to practice teach. The present slate of officers is as follows: Billy Abercrombie, President, from Fountain Inn; Vaughn Carmichael, Vice-President, from Johnstown, Pa.; States McCarter, Treas., from Clover; Andrew Cross, Secretary, from Cross; Wayne Mack, Reporter, from North; Hugh McClimon, Sentinel, from Greer; and Professor F. E. Kirkley, Advisor. New officers for 1958-59 will be elected at the next meeting.

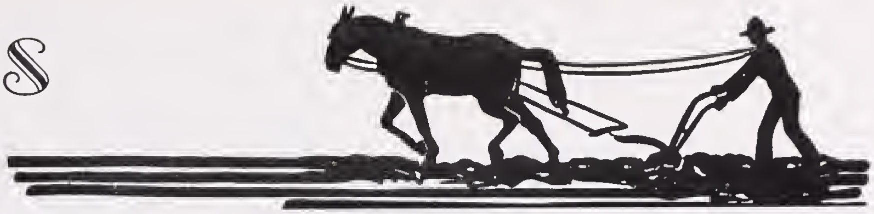
NEW MEMBERS TAKEN INTO ALPHA TAU ALPHA

Four new members were taken into the Kappa Chapter of Alpha Tau Alpha recently. They were informally initiated the week of April 14, and the formal initiation was held April 18. The students initiated into the chapter were as follows: James D. Stone, junior from Johnsonville; F. Wayne Mack, sophomore from North; Thurman E. Clardy, sophomore from Wampee; and John G. Snowden, sophomore from Lake City.

Alpha Tau Alpha, a National Professional Agricultural Education Fraternity, is an organization on college campuses composed of young men in training to teach Vocational Agriculture. Members are selected on the basis of their scholastic abilities, leadership, and their desire to contribute their utmost to Vocational Agriculture.

E FURROWS

ERCROMBIE



STEMBRIDGE WINS PHI KAPPA PHI AWARD

Gene Stembridge, Clemson College senior in horticulture from Ellijay, Georgia, has received a $2500 fellowship of the Phi Kappa Phi honorary scholarship society.

Stembridge was one of only four annual selections by the national committee, with headquarters in Los Angeles. The award, which can be used in any graduate school of his choice, is the first ever won by a Clemson nominee.

Vice-president of the Clemson chapter, Stembridge plans to enter either the University of Maryland or Michigan State University to do graduate work in plant breeding. He also will accept a quarter-time assistantship in research.

At Clemson, he has a grade point ratio of 3.85 (possible 4.0) and topped the junior class academically last year.

The honoree is past editor of **The Agrarian**, student publication of the School of Agriculture; secretary of the Student Assembly; chairman of the Student Agricultural Council; and chancellor of Alpha Zeta, honorary agricultural fraternity. He also is a member of the Horticulture Club and Phi Eta Sigma, honorary freshman scholastic fraternity.

ARANT AWARDED RALSTON PURINA SCHOLARSHIP

H. Todd Arant, Bowman, has been awarded the annual $500 Ralston Purina Scholarship for incoming Dairy, Animal Husbandry, and Poultry seniors. This was announced by J. D. Sykes, Purina vice-president.

Arant, an animal husbandry student, was selected by the scholarship committee at Clemson for outstanding scholastic standing, leadership, and character.

He is a member of the Block and Bridle Club and Alpha Zeta, honorary agricultural fraternity; candidate for the 1958 Clemson livestock judging team, and an exceptional member of the state 4-H organization. Last fall he represented the Clemson chapter at the International Block and Bridle meeting in Chicago.

The Purina scholarship program is in its fourth year, serving 48 land grant colleges in the United State and three Canadian agricultural colleges.

4-H CLUB ELECTS OFFICERS

The Clemson 4-H Club met April 10 for the purpose of electing officers for next school year. The following men were selected to serve as officers for next year:

President	Frank Sutherland
Vice President	Curtis Wallace
Secretary	H. C. McCord
Treasurer	J. H. Griffin
Cor. Sec.	Ben Brockington
Publicity Chairman	Melvin Rogers
Sergeant-at-Arms	B. W. Anderson
Faculty Adv.	H. O. Vaigneur

Because of lack of time and added responsibilities, Dr. W. A. King resigned as faculty advisor for the club. The members regret that he could not continue to serve in this capacity.

DR. M. D. FARRAR ADDRESSES CONVENTION

Dr. M. D. Farrar, dean of the School of Agriculture at Clemson College, addressed the 23rd annual Chemurgic Convention in Chicago, April 23-24, on "New Crops in South Carolina." Dean Farrar stressed the role of bamboo.

His Chicago appearance followed attendance of the eighth annual convention of the National Institute of Animal Agriculture at Purdue University, Lafayette, Indiana, April 21-22.

ANIMAL HUSBANDRY

On Saturday March 22, 1958, the Clemson College Block and Bridle Club prepared and served their traditional delicious Bar-B-Q to over a 1,000 persons who attended the annual spring intersquad game of the Clemson Tigers.

The Bar-B-Q was prepared by the members of the Block and Bridle Club under the direction of their club president, William Weeks, Animal Husbandry senior from Alto, Georgia, and club advisor Professor Dale Handlin of the Animal Husbandry Department.

HORTICULTURE CLUB ELECTS OFFICERS

The Horticulture Club recently elected officers for the next school year. Those elected were John Howard, President; "Sonny" Rhem, Vice President; Ralph Boatwright, Secretary; and E. C. Chandler, Treasurer.

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By Ashton Phillips

Thomas Virgel Wilson

One of the newer and more outstanding members of the Agricultural Engineering Staff is Thomas Virgel Wilson. Professor Wilson is a native of South Carolina. He was born and reared at Piedmont and received his bachelor of science degree from Clemson College in 1942. He continued his training in Agricultural Engineering at Purdue University, and he received his master of science degree in 1949.

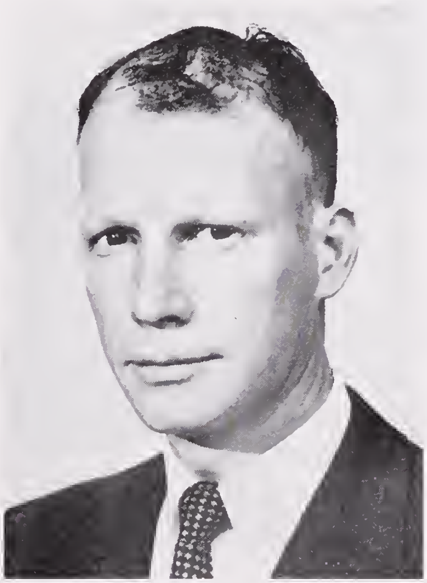
For one year he was in the United States Army. Later, he entered the United States Air Force, where he served two and one-half years. While acting in this capacity, he was a pilot—flying mainly the B-17. While serving with the 8th Air Force in England near the end of the war, he flew three combat missions.

After the war, he returned to the University of Georgia where he joined the Agricultural Engineering Staff and taught Soil and Water Conservation Engineering. Upon leaving the University of Georgia, he did further graduate work and taught Soil Conservation at North Carolina State College. While there, he did research work with irrigation.

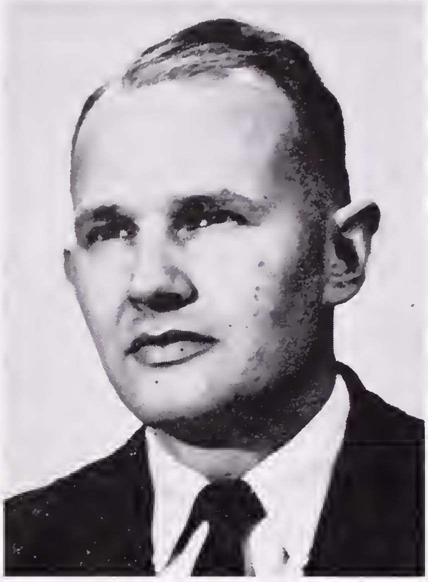
Professor Wilson returned to Clemson College in 1957 to serve as instructor in the Agricultural Engineering Department. At the present time, he is teaching Soil and Water Conservation.

Dr. J. T. Lazar of the Dairy Department is a well-known figure to the agriculture students at Clemson. Dr. Lazar is a native of Florence, South Carolina. He received his bachelor of science degree in Dairying at Clemson College in 1943. During his college years Dr. Lazar was very active in school activities. He was a member of the Pershing Rifles, 4-H Club and the Dairy Club. He served as a Company Executive Officer of his company in his senior year. Dr. Lazar served in the United States Navy from 1943 through 1946 as a lieutenant. After returning from active duty with the Navy, he taught in the Dairy Department for several years. Later, he went to Cornell University and received his Master of Science degree in 1949. Dr. Lazar attended North Carolina State College and received his Ph.D. degree in Dairy Plant Management and Industrial Engineering in the summer of 1953.

Dr. Lazar is playing a very important role in actively guiding our leaders of tomorrow through their college years. He is faculty advisor to the Dairy Club and assistant advisor to the Student Agricultural Council. He was very active in planning the School of Agriculture's part in our first "Clemesta." Dr. Lazar is a member of the Fort Hill Presbyterian Church.



Dr. J. T. Lazar



Dr. W. B. Boykin

Dr. W. B. S. Boykin is a prominent figure in the Agronomy Depart at Clemson College. He is held in high esteem for his instructional ability and interest in all his students. Dr. Boykin hails from Boykin, a small town in Kershaw County, South Carolina. After graduating from Camden High School in 1943, he served with the United States Army for three years. Dr. Boykin received his B.S. degree in Agronomy at Clemson College in 1950. He was active in college activities while at Clemson. He was selected in Who's Who and was a member of Blue Key. In the School of Agriculture he was a member of Alpha Zeta. He was also a member of Phi Kappa Phi, the honorary fraternity for the entire college.

Dr. Boykin received his Ph.D. degree in Agronomy at the University of Wisconsin in 1954. He returned to Clemson to serve on the faculty—teaching field crops and soils laboratory. At the present time, Dr. Boykin is teaching several Agronomy courses and is also doing research work in Agronomy.

Dr. Boykin is a member of Sigma Xi, Gamma Delta, the American Society of Agronomy, Soil Scientist of America, and the Soil Conservation Society of America. Dr. Boykin is Faculty Advisor to the Student Agricultural Council.

"Clemesta" visitors observing Science in Agriculture.

CLEMESTA—1958

(Continued from page 7)

gers. The conveyor moves the birds to the rotary picker into which the birds drop. This picker picks the smaller feathers and those difficult to remove. At the end of a pre-determined time, the birds are forced out a door at the bottom, at which time a worker re-hangs the birds on the shackles. Any remaining pin feathers are removed by hand. The birds then move to the washer where they are washed in cold water and are brushed down by the rubber fingers. The birds move without stopping through the assembly lines where the entrails, feet, head, and oil sac are removed. An automatic gizzard peeler is operated by one man to remove the lining from the gizzards. The birds are washed and taken off the line and chilled in ice water.

Next to the dressing plant were two rooms of exhibits that were prepared to show Science in Agriculture. The development of the turkey from the egg to the table was shown in an exhibit that showed turkey eggs, poults, and dressed turkeys. The production of Asiatic flu vaccine was demonstrated with the use of 11 day old embryos. Sex linkage was shown by crossing a New Hampshire male and a Delaware female. The eggs were shown hatching out in an incubator with a glass top. All the males turned out to be silver (white) in color and the females turned out to be gold (red) in color. The 2 day old chicks were shown to prove this point.

A sign showed that poultry plays an important part in South Carolina's economy. Poultry ranks 4th in cash income to farmers. A chart showed the many job opportunities for anyone interested in poultry as a career.

Science in poultry feeding was illustrated by having ingredients on a table with the proper amount of each ingredient weighed out accurately for a broiler ration. This exhibit won an honorable mention for the individual exhibits. One nutritional exhibit demonstrated the ef-

(Continued on page 14)

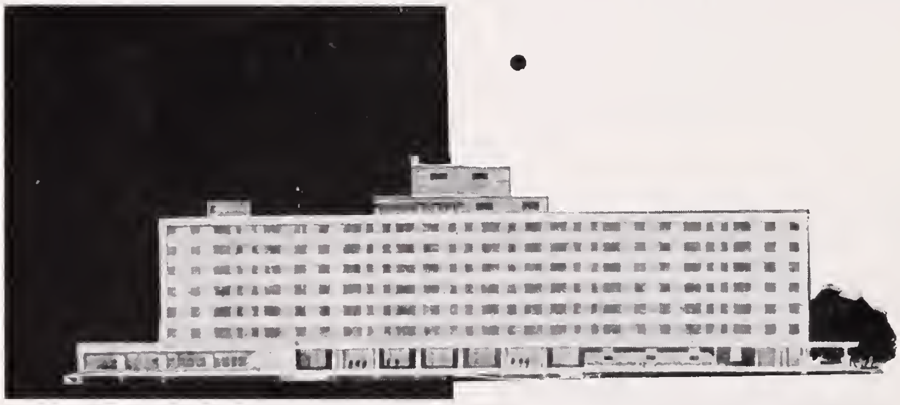
BEEKEEPING

(Continued from page 5)

April. Another important time is during the summer between honey flows, or when there is an extended drought. One of the most common foods for this purpose is granulated sugar. It may be fed loosely, or mixed with equal amounts of water to form a syrup. Another good food is honey of inferior quality mixed with an equal amount of water. If a colony of bees need feeding, they should have at least ten pounds of syrup. If bees cannot be fed adequately, they should not be fed at all.

It is this writers opinion that South Carolina has a tremendous need for a good additional income source for many farm families. Beekeeping has the potential of being this kind of enterprise because many members of the family could be operating a bee business when they may be otherwise unoccupied.

Additional information will be furnished by contacting Mr. W. H. Purser, Entomology Department, Clemson College, Clemson, S. C.



In the foothills of the beautiful Blue Ridge Mountains, you'll find the Clemson House located in a unique setting — right on the campus of Clemson College. Here you will find all of the services of a great metropolitan hotel yet you will be far away from the noise of a large city. And you'll enjoy the beautifully landscaped grounds and the flower beds. The splendid accommodations and the excellent cuisine offered at the Clemson House are combined with warm friendly hospitality and fine service. The Clemson House is a gem among fine hotels, and the rates are almost unbelievably low. All rooms are air conditioned. Four dining rooms and the Tiger Lounge and Coffee Shop. There is swimming, fishing and golf nearby

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ISSAQUEENA - - -

Combination Wildlife Refuge And Forest Management Area

By Garland Gravely, For. '59

Lake Issaqueena, located a few miles northwest of Clemson, furnishes the name for the Issaqueena Area, a tract of land encompassing the lake and approximately 10,000 acres of surrounding timberland.

The lake itself, and the area immediately adjacent to it, was once the site of a very beautiful recreational area, complete with beach, bathhouse, boathouse, and picnic areas around the lake. The boathouse burned shortly before World War II, and the area has since been on a decline. Few people realize that the beauty of the area was upheld by nature, and only recently has any effort been extended to put the recreational facilities and the roads back into shape for the visiting public. The picnic areas are being cleared, and firewood is being supplied to them. The roads are being regraded, and a new bridge at the head of the lake to replace the old one that caved in is proposed. It is hoped that in the not-to-distant future, Issaqueena will again gain favor in the eye of the public as a clear, beautiful, and wholesome recreational area for the families of the surrounding communities.

Recreation is not the only aspect being considered. At present, the surrounding forests are being used to provide experimental areas for the forestry students. There are four experimental areas being used to illustrate the different grades of forest thinnings. Another area is being used in an attempt to determine the effect of the relation of the cardinal points to the survival of Arizona Cypress. Still other areas serve as illustrations of the different types of forest stands. All of these areas are utilized extensively by the forestry professors, for the more time the forestry student spends in outdoor laboratories, the better he will be prepared to handle the problems that will afront him in his profession.

The area is also under management by the members of the Forestry Department Staff. Complete and accurate records and maps are kept, and the area is cruised periodically to gather valuable information concerning the growth, volume, and condition of the different forest stands and types.

In addition to the forestry and recreational aspects, there is at present an extensive wildlife management program concerned with the area. It is headed by Dr. Webb, whose offices are here in Clemson. A great deal of work is being put forth on this wildlife project which includes the management of deer and turkey. The two species are the White-tailed Deer (Ococoileus virginianus) and the Eastern Wild Turkey (Meleagris gallopano). In the next few paragraphs I will try to give you a few facts on the life and management of the wildlife program.

It is perhaps no exaggeration to say that of all our native mammals, none has played so important a role in the history of America as the deer, and today no other is better known or more widely prized as game. Formerly, nearly half of the United States was covered with forests, and throughout these wooded regions deer were present. The present deer population of the United States numbers more than three and one half million. This is a marked reduction from the original population which Seton estimated to be forty million. During the 1800's deer all but disappeared in many localities in the East, but the last fifty years have seen a sharp reversal of this trend in many sections, though by no means everywhere. Moreover, the great increase in abundance continues at the present moment, due in part to effective conservation policies, to refuges such as Clemson's Issaqueena Area, and to other areas of second-growth hardwoods of various ages. Aided by these factors, the heavy toll taken by hunters annually is balanced and the deer is in no danger of extermination.

A great deal of work has gone into the program to bring the deer population back to its present level. This has been accomplished by various management methods, such as the ones used on the Issaqueena Area, but in some areas, this increase in the deer population has been a detrimental effect to man's welfare, due to the larger herds expanding so rapidly. This results in damaged orchards, damaged crops, and a reduction in forest reproduction.

The following are some of the management techniques used on the Issaqueena Area. The census method used here at Clemson is known as the drive-census method. Basically, the drive-census method is a sampling technique by which the population on any given unit of range is computed by proportions from 100% counts on selected sample plots of known area. These sample units are selected and prepared in advance of the drive. "Counters" are stationed along the boundary on three sides of the sample. Drivers line along the fourth side and proceed abreast of each other along the sample, driving the deer within the sample area ahead of them and eventually outside it. They are counted as they pass out of the area.

When the approximate number of deer in an area is known, it can be determined how intensively the area should be managed to support them. The following are some of the other measures practiced on the Issaqueena Area:

1. The maintenance of existing hardwood cover to furnish a good food supply for the deer. The deer eat the fruit of the older hardwoods, and the leaves and twigs of the young ones.

(Continued on page 14)

The theme of this exhibit was "4-H'ers Learn by Doing"

"CLEMESTA"

(Continued from page 12)

fect of adding a small amount of an essential amino acid (the building blocks of protein) to a semi-purified ration resulting in a spectacular growth response using feather meal as a source of protein.

AGRICULTURAL EDUCATION

By F. W. Mack, V.A.E. '59

The primary efforts of V.A.E. is toward teaching all these different facets of agriculture and life. Where in this world is a more important job than that of teaching our boys and girls. Sure we must have businesses, farming, rocketmen, politicians, etc., but these can't "go" if there aren't capable men and women to keep them going. Each year, the most important production process in the United States ends for many on the high school steps as students step out into that larger world. Where is there a more important crop? Yes, teachers should be capable individuals.

In our display we attempted to show the public what and how we train young men to be worthwhile humans in a worthwhile society. We will try to develop leadership in these young men. If you look around you in the School of Agriculture, you can recognize the men who have received training in F.F.A., or other similar organizations in high school. You can surely recognize those who haven't had such training.

ANIMAL HUSBANDRY

By Todd Arant, A.H. '59

At "Clemesta," the Animal Husbandry Department topped all other departments by winning first prize in departmental exhibits. Because of the ever-increasing livestock production, more and more people are becoming interested in this field. The theme of one exhibit was job optunities in Animal Husbandry.

The Animal Husbandry exhibits featured the advancement that has been made in the livestock industry in the past few years and what we can expect to come in the very near future. It pictured the advancement that is possible through a B.S. degree in the field of Animal Husbandry. We can say that livestock is not a thing of the past but "a thing of the future." All the exhibits were planned and erected by members of the Block and Bridle Club with the help and cooperation of the Animal Husbandry Department.

The dairy exhibit showing a model cow, "nature's greatest food factory."

ISSAQUEENA

(Continued from page 13)

2. The development of food supplies by planting. Feeding plots have been established at different sites around the area. Fescue, Chufers, Ladino and such foods are planted to insure the deer a good food supply.
3. Stray dogs are kept out of the area as much as possible.

The second phase of wildlife management concerns the Eastern Wild Turkey. The first Thanksgiving turkey, now the symbol of America's bountifulness, came from the wild flocks that formerly flourished in many of the forests of the Eastern United States. In relation to former numbers wild turkeys are now at an exceedingly low point. Areas like the one here at Clemson are now aiding in building that population toward its former level.

The census method used for wild turkey varies, the most important one being the complete census where the woods are searched for the turkey flocks and the individuals counted. This cannot be used at Clemson due to its expense and time consumption. The drive census method used for the deer is at the same time used for the turkey.

The control of hardwoods used for the deer can also be applied to the management of the turkey. Turkey's use the fruits from oak, beech, etc., as food, especially in the winter months.

Food patches are also used for turkey. Fescue, Ladino, and Chufers are planted. You will notice that these are the same foods that are planted for the deer, which saves considerable time and expense in the establishment of the food plots.

From this discussion you may see the wide and varied use of the Issaqueena Area. Clemson College is fortunate in having such an area, for many schools have to do without, while others have much smaller areas thirty miles or more from the school. We feel that this area will aid in giving Clemson one of the finest Forestry Schools in the South and possibly lead to the establishment of a four-year course in Wildlife Management.

New Idea No. 400 pull-type parallel bar rake. Tested on the torture track, proved on farms.

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TALL CORN

By E. N. Miller

"There are four requisites for a good short story," explained the English teacher, "brevity, a reference to religion, association with royalty, and an illustration of modesty. Now I will give you thirty minutes to write a short story, remembering what I have told you.

After 10 minutes Jim said he was finished and was told to read his story to the class. He read " 'My Gawd," said the countess, 'take your hand off my knee'."

* * *

I call my girl Real Estate because she means a lot to me.

* * *

Ali Baba went up to the entrance of the cave and cried, "Open, Sesame!"

And a voice from the cave replied, "Sez who?"

* * *

"I'll teach you to make love to my daughter!"

"I wish you would sir. I'm not making much progress."

* * *

Sailor: "Waiter, bring me some tomato juice for a pickup."

Waiter: "Yes sir, and what will you have for yourself?"

* * *

A woman's best asset is a man's imagination.

* * *

A female brain is slightly smaller and less complex than the male brain. Her brain is divided into only two parts: (1) dollars and (2) cents.

* * *

"What is the penalty for bigamy?"

"Two mothers-in-law."

* * *

Two neighboring sows were talking through the fence. Said the first:

"Have you heard from your boy friend lately?"

"No, but I got a litter from him yesterday."

* * *

"May I kiss your hand?"

"What's the matter, my mouth dirty?"

"My mother said I must not see you any more," sighed the young lady.

"O.K.," grinned the modern youth, "we'll just sit out on the porch where it's good and dark."

* * *

Husband (after an hour of furious quarreling): "I only wish you were a man."

Wife (sweetly): "So do I, darling. I think there should be at least one in every family."

* * *

Diner: "Two eggs please. Don't fry them a second after white is cooked. Don't turn them over. Not too much grease. Just a pinch of salt on each. No pepper . . . well, what are you waiting for?"

Waitress: "The hen's name is Betty. Is that all right sir?"

* * *

The local politician was making a speech regarding the type of milk which would be supplied to the school children.

"What this town needs is a supply of clean, wholesome milk, and it's up to you voters to take the bull by the horns and demand it."

* * *

Perfume salesgirl showing newest brand to the co-ed: "To be frank, I consider it unsportsmanlike—in the same class with dynamiting fish."

* * *

The traveling salesman ran out of gas one evening on a lonely road and asked at the only farm house in sight:

"Can you put me up for the night?"

"I reckon I can," said the farmer, "If you don't mind sharing a room with my young son."

"Good heavens," gasped the salesman, "I'm in the wrong joke."

* * *

Home town girl: "I just told Tom I never want to see him again."

Mother: "Why?"

Girl: "I just found out he doesn't plan to get married—he's studying for a bachelor's degree."

Frosh: "Why did your instructor make you write your name in your books?"

Soph: "To kill the resale value."

* * *

Eugene: "What do you think of my jokes? They're crisp as a cracker, aren't they?"

Barbara: "Yes—and just as dry and crummy."

Now I lay me down to sleep.
The lecture's dry, the subject deep.
If he should quit before I wake
Give me a poke for goodness sake.

* * *

As one termite said to another, "This should bring down the house."

* * *

When my girl began acting high hat I asked her to please take off her brassy air. Now she won't even speak to me. I wonder . . .

* * *

"Darling, I have missed you!"
Her voice was full of pain,
And she lifted the revolver
And fired at him again.

AGRARIAN PHILOSOPHY

(Continued from page 1)

a chance to catch up on the progress being made at Clemson.

The exhibits were especially outstanding, showing that much time and effort was spent not only in constructing the exhibits but also in planning and designing them.

In recognition of our first "Clemesta", we would like to present a few of the 75 exhibits that were on display. We of the Agrarian staff would like to congratulate the winners this year, and we know the event will grow with the years.

* * * * *

By the time you receive this issue, you will be making plans for an enjoyable summer. Our staff hopes you have a nice vacation, and we will be looking forward to see you return next year with zest to work.

—S. M. M.

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THE Agrarian

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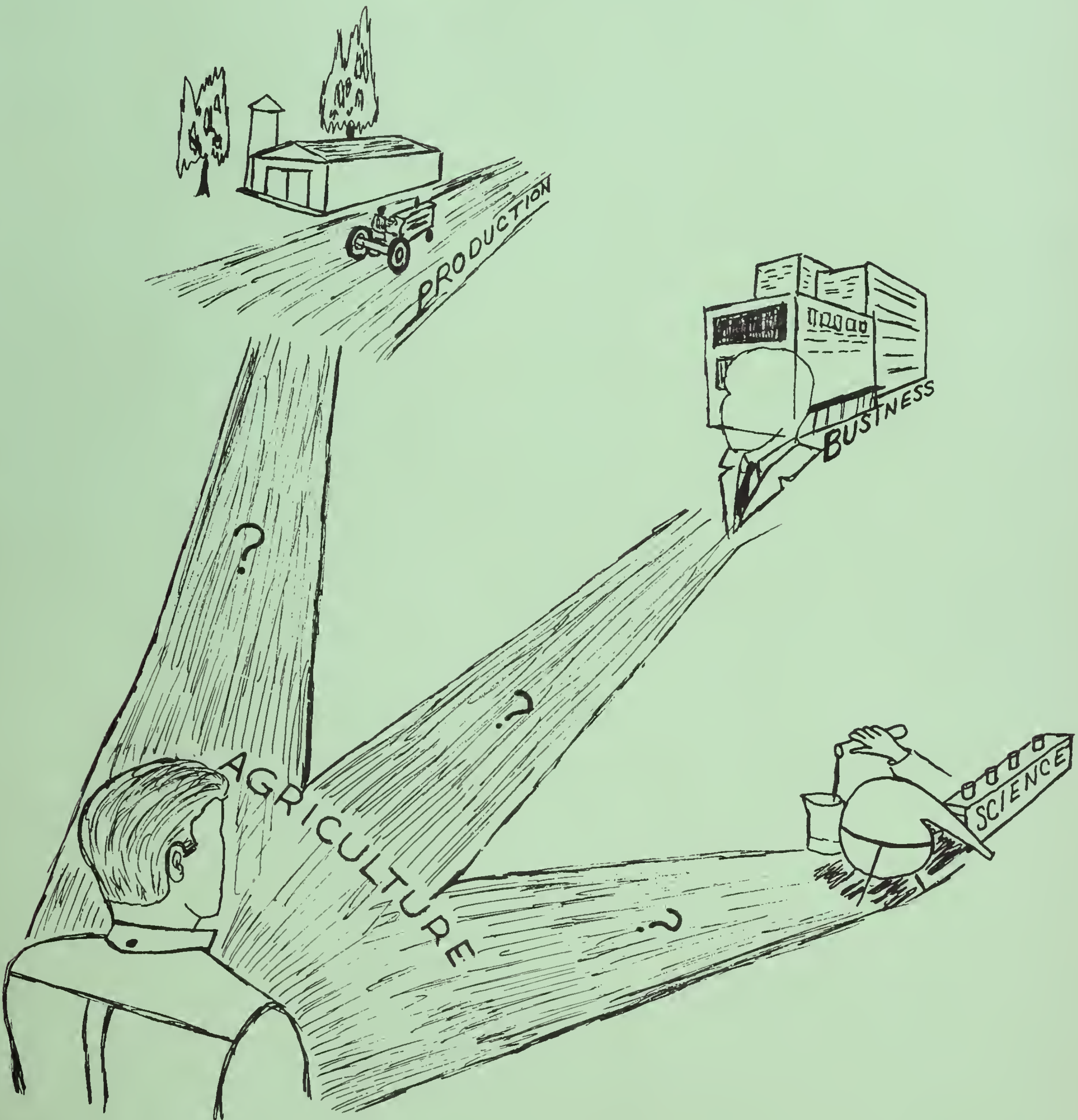

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CLEMSON COLLEGE

THE Agrarian

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THE COVER

Artist Wilson Carrett has depicted for the AGRARIAN the great triangle of today's dynamic agriculture. The analogous roads, though divergent, have a common destination. Effective leadership for Tomorrow's Agriculture will be assured through education in agricultural science, business and production technology.

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THE AGRARIAN

Published each semester by the undergraduate agricultural students, Clemson College, through the Council of Agricultural Club Presidents. Opinions expressed in this magazine do not necessarily reflect the policy of the School of Agriculture or Clemson College.

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Agricultural Economics Association
Alpha Tau Alpha
Alpha Zeta
American Dairy Science Association
Am. Soc. of Agricultural Engineers
Block & Bridle Club
Clemson College 4-H Club
Collegiate Chapter FFA
Eta Zeta
Forestry Club
Horticulture Club
Kappa Alpha Sigma

Volume XVIII December, 1960 Number 1
CLEMSON COLLEGE, CLEMSON, SOUTH CAROLINA

FROM THE DEAN'S DESK

M. D. Farrar, Dean of Agriculture

The Cost of Becoming Educated

Every fall thousands of eager, alert, and presumably qualified men and women enter hundreds of colleges with the expectation of securing an education and a degree. They have been exposed to similar courses of training, have met certain entrance requirements, and are not ignorant of what they will face in competition, cost or curricula. However, students begin dropping out almost at once and four years later over half have left college. Why did they quit?

The obvious reasons present themselves: Lack of adequate preparation, lack of financial resources, emotional or moral instability, wrong choices of college or courses, and lack of ability. A less obvious reason, but more important than any of these, is that the student never had the sincere desire to become educated. He had come to an institution devoted to the development of the intellect with little will or desire to use what was offered to him.

No one can learn unless he wants to. No one can take four years, or more, of difficult, even exhausting concentration, self-denial, the constant criticism of performance, the pruning of ideas and ideals, and the monotonous "grind" of daily assignments unless he has a deeply ingrained desire to become intellectually capable.

Education cannot be taken like a pill or bought on the installment plan. Learning is a slow, hour by hour process which is never finished. Completing courses or achieving a degree does not complete the learning process, but merely develops the capacity for more learning. For most students the education that follows graduation is learned by experience on the job. For the few, the developing of mental capacity along lines of specialization continues, but only if the desire to learn is great enough to stimulate the student to pay the price in additional time and effort. The cost of this advanced education involves not only the expenses of attending college but also the postponement of earning and of the establishment of life work. However, we get out of any endeavor only what we are willing to put into it.

How much are you willing to pay for this increased capacity to learn?

M.D.Farrar

BEEN STUDYIN' IT OVER....

An Editorial

.... And we've decided there may be lots of folks around who'd like to keep in touch with student activities over on Clemson's "Ag. Hill". Therefore, the various student agricultural organizations have joined together to assemble for you this publication which we wish to be considered a personal letter.

Our letter will be semiannual, being published near the end of each regular semester.

We are proud to have chosen for our title "The Agrarian." To many this will be a most familiar name, and rightly so. Beginning in 1938 and continuing through 1958, "The Agrarian" disseminated in a commendable manner the news and views of Clemson's Agricultural students. Certain problems associated with commercial aspects of the magazine necessitated a temporary discontinuation.

The present "Agrarian", as you will observe, keeps faith with the original in its point of view and objectives. Writers from the several organizations of agricultural students relate some story concerning their profession. Woven into each message may probably be discovered a bit ot the writers individual philosophy as it relates to his profession.

In keeping with our intention to make this more of a message than a magazine, no advertisements are included. Furthermore, technical type articles are minimized.

We address "The Agrarian" expecially to the young men and women of South Carolina high schools, through their agricultural leaders; to the families of Clemson's agricultural students; to our agricultural leaders and alumni; in short, to anyone who might share our enthusiasm toward the profession of Agriculture.

TREE PLANTING
A MATTER OF PERSPECTIVE

It is my opinion that the steward of the soil who heels into favorable locations diminutive seedling trees, demonstrates his best management ability. More projection of thought is required to see in a seedling, boards for a grandson's home than is necessary to visualize the reaping of grain sown the very year of harvest.

(continued page 5)

The Editor, with his young foresters

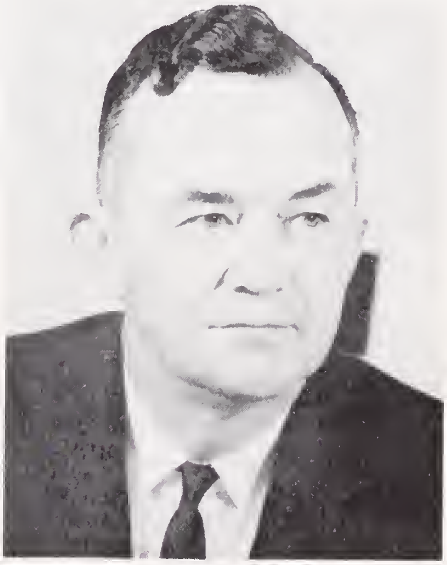
MODERN EDUCATION FOR TOMORROW'S AGRICULTURE

Dr. J. W. Jones, Director of Agricultural Teaching

The School of Agriculture at Clemson recently approved significant changes in the fields of instruction in order to provide the best possible education for the current and future needs in the rapidly changing industry of agriculture. The advance of science and technology has transformed agriculture from what was basically farming into an extremely complex industry. The new agriculture includes much more than farm production. About 7 million people produce for and service farmers, and 11 million process and distribute farm products. These two segments, together with farm production which employs 8 million workers, provide jobs somewhere in agriculture for about 26 million Americans. In addition a half million scientists directly or indirectly serve agriculture. In other words, approximately 40 percent of all jobs are related to agriculture.

Our land-grant colleges, such as Clemson, are now graduating about 7000 students each year in agricultural courses -- less than one half the number needed. This means that 15,000 jobs are available each year to college agricultural graduates - jobs important to every person, jobs with futures, jobs with a challenge, jobs with financial and personal rewards.

Among the major changes in the fields of instruction is the provision in several curricula for a student to choose between two or all three of the options in Science, Business, and Production Technology.



Dr. Jones

SCIENCE OPTION

This option emphasizes the basic sciences that prepare students to contribute to the advancement of knowledge in their respective fields. It is designed for students whose anticipated field of work requires considerable scientific training, usually including graduate studies. Employment opportunities include research with State Agricultural Experiment Stations, The United States Department of Agriculture, and industrial and commercial organizations; and teaching in colleges of agriculture, and other educational work with Federal, State and industrial organizations.

(continued page 5)

NEW EDUCATION

(continued from page 4)

BUSINESS OPTION

This option emphasizes principles and practices of business management as applied to businesses and industries associated with agriculture. It is designed for students who plan to work with one of the many businesses and industries that provide supplies and services for the farmer, and process and distribute farm products. Employment opportunities include work related to meat and poultry processing, sales and service of farm machinery, manufacturing and sales of fertilizers and pesticides, dairy and food processing, grain and seed processing, feed manufacturing, banking and credit insurance, farm management, land appraising, and the marketing of agricultural commodities.

PRODUCTION TECHNOLOGY OPTION

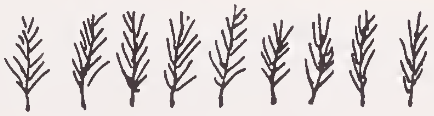
This option emphasizes the application of scientific principles to agricultural production. It is designed for students whose anticipated field of work requires broad general training in scientific and practical agriculture. Employment opportunities include general and specialized farming; agricultural extension service; teaching vocational agriculture; conservation of natural resources; agricultural communication; and agricultural services of The United States Department of Agriculture, State Departments of Agriculture, and private enterprises.

The curriculum in Biology has been transferred from the School of Arts and Sciences to the School of Agriculture and reorganized with options in Botany and Zoology. All revised curricula, including Biology, will become effective for a new freshman entering in June or September 1961. Students currently enrolled in the basic agricultural curriculum, Agricultural Economics, Agricultural Education, Agronomy, Animal Husbandry, Dairy, Entomology, Horticulture and Poultry will be expected to choose, around the middle of the second semester, between the curricula now in effect and the revised curricula. Students currently enrolled in Forestry and Pre-Veterinary Medicine will be expected to complete the requirements of the curricula now in effect. Students currently enrolled in Agricultural Engineering will be expected to complete the requirements of the curriculum now in effect, with the exception of two course substitutions. Classes for the second semester of this school year will be scheduled in accordance with the requirements of the curricula now in effect.

Editorial - (continued from page 3)

Each generation can inherit no greater legacy than that of trees. My Grandfather passed along to my Father a mountain farm well populated with native hardwoods remaining from the former's harvest of the virgin timber. This stand yielded the house and farm building of my home place, with plenty left over to sustain wildlife and reseed the area. About the time of my birth, Dad set an acreage in white pines which now contribute significantly to the farm's forest production. Eight years ago, following this example, I underset some of the hardwood area with pine which, to my young sons, are even now rather "lofty" fellows. By the time the boys reach maturity the beginning harvest of these should be at hand.

Not only will this green inheritance produce economic returns, but the soil which produces it will be preserved, and the hillside will be more sightly to look upon.



"IDEAL VARIETY"

GOAL OF CLEMSON'S SMALL GRAIN BREEDING RESEARCH

Hugh B. Gray
Agronomy, '64

Plant breeding, a relatively new science, offers a golden opportunity for improving the efficiency and stability of the production of field crops. For example, the development of Anderson wheat, which was released by the South Carolina Agricultural Experiment Station in 1952, is estimated to account for more than a million dollars in additional income for South Carolina farmers each year. The cost of the development of a new variety is generally less than one tenth percent of the returns, and in many cases the returns from such a development in one year may exceed all money spent on agricultural research.

Clemson College's extensive research program on breeding of small grain (wheat, oats, and barley), under the direction of Dr. W. P. Byrd, includes the careful observation of more than 45,000 selections of small grains each year. Each year many of these are selected for critical evaluation of yield and other important characteristics in comparison with standard variation. Selections are saved for further testing only if they exceed the standards for one or more important characteristics and are equal in all other respects.

This "ideal variety" of a small grain may be described as one which is resistant to all diseases, insects, weather hazards, responds to high fertilization, is short in stature, resists lodging, produces high yields of grain and forage of suitable quality.

Dr. Byrd observes test plants

Although the short term goal of the small grain breeding program is to meet the most critical needs of the farmer through the development of new varieties, the greatest effort is directed to finding new breeding lines for future use. It is envisioned that desirable characteristics from as many as 8 to 10 different variations may be incorporated into one to produce the so-called ideal type.

The search for new breeding material with specific characteristics constitutes a major part of Dr. Byrd's program. Each year many untested varieties are grown for the evaluation of their potential for use in the "crossing" program.

This fall a collection of 215 of the "elite" Russian oat varieties brought to the United States by the U.S.D.A. is being grown at Clemson as part of the search for new materials for future oat improvement. These selections are being grown cooperatively with other plant breeders in Georgia and Florida.

With work like this going on at Clemson, soon varieties may be "tailor made" to meet the needs of the farmers who fill our country's bread basket.

MONEY

EARMARKED FOR EDUCATION

Hugh Knight, Feature Editor

Fourteen scholarships, valued at $300.00 each, are available to entering freshmen in the School of Agriculture. Some of these are renewable for the sophomore year providing the person's record as a freshman is satisfactory. In addition to these scholarships for freshmen and sophomores, there are eight scholarships available for either juniors or seniors in amounts ranging from $200.00 to $1,000.

The Freshmen Scholarships include the Sears-Roebuck Scholarships, the Smith-Douglass Scholarships, the George E. & Leila G. Singleton Scholarship, and the South Carolina Poultry Improvement Association Scholarship.

The Sears-Roebuck Foundation provides for ten one-year scholarships valued at $300.00 each, with an additional sophomore award of $300.00 to the most outstanding freshman Sears-Roebuck scholar. These scholarships are awarded on a state-wide basis to South Carolina boys who have demonstrated an interest in agriculture.

The Smith-Douglass Company, Inc. of Wilmington, North Carolina provides for two four-year scholarships valued at $750.00 each, payable as follows: $300, freshman year; $200, sophomore year; $150, junior year; and $100, senior year. To be eligible for one of these the recipient must be a resident of one of the following South Carolina counties: Clarendon, Darlington, Dillon, Florence, Georgetown, Horry, Lee, Marion, Marlboro, Sumter, and Williamsburg.

Mr. G. H. Singleton contributes one scholarship valued at $300 per year. It may be awarded for the second year to the same person if his record as a freshman is satisfactory. This scholarship is awarded to a South Carolina farm boy with preference given to residents of Oconee, Pickens, and Anderson counties, in that order.

The South Carolina Poultry Improvement Association gives a one-year scholarship valued at $300.00 to a student majoring in Poultry. This scholarship is renewable for the sophomore, junior, or senior year on a competitive basis with other students majoring in poultry.

To be eligible for one of these freshmen scholarships in 1961, the applicant must meet the freshman entrance requirements at Clemson and must enroll in the School of Agriculture either in the summer or fall of 1961.

The scholarships are awarded on the basis of the applicant's high school record, financial need, leadership, and the score made on the entrance examination required of all Freshmen entering Clemson College. The winners are selected by a Clemson College Agricultural Scholarship Committee.

To apply for one of these scholarships, obtain, fill out, and return the necessary scholarship application form, making sure that the completed form is mailed before midnight on March 1, 1961. This form may be obtained by writing to: Agricultural Scholarship Committee, School of Agriculture, Clemson College, Clemson, South Carolina. Also to be eligible, the applicant must take the College Entrance Examination not later than February 4, 1961.

Such assistance programs have proved to be decisive factors in launching many successful agricultural careers. High school seniors, anticipating enrolling in Clemson's Agricultural program, are urged to take advantage of these opportunities.

MEAT THE EATERS

Bill Johnston, A. H. '61

Delicious, savory, nutritious, satisfying meat--whether it be beef, lamb, veal or pork--truly is one of the most important foods for American consumers. Most housewives consider red meat to be the "center of a meal", and plan their meals around the meat item. In the United States alone, approximately 150 pounds of beef, lamb pork and veal are consumed annually per capita.

About 40-50 variously named cuts may be obtained from a beef carcass. This system of naming cuts is rather complicated for the average housewife and she may be confused about the proper cooking method.

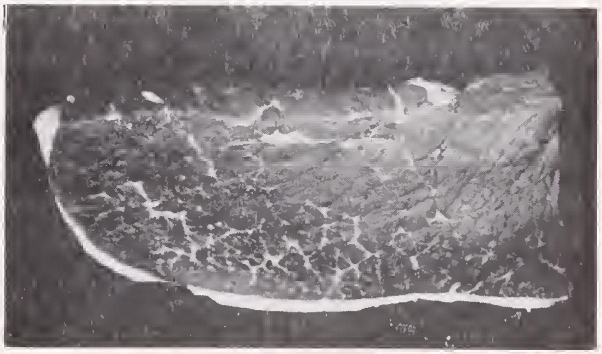
It is very likely that in the future these cuts may be sold in a boneless, portion-controlled form and the cuts grouped according to recommended cooking methods. Examples of this classification are "dry heat steaks or roasts" or "moist heat steaks or roasts". Dry heat steaks could be cooked by broiling or charcoal grilling and would consist of the more tender steaks from the carcass. Moist heat steaks or roasts would consist of less tender cuts that require more tenderizing through cooking. Generally, the less tender cuts of a beef carcass consist of the harder-working exercise muscle such as those found in the round or chuck. The more tender cuts, on the other hand, are obtained from muscles that do less work in moving the animal around, or the "support muscles".

Most of a meat cut consists of lean or muscle, but a certain amount of "marbling" or fat within the lean is needed to make meat more tender. Federal meat graders grade beef, veal, and lamb in an effort to select the more tender meat for consumers' use. They consider such factors as maturity or age of the animal, meatiness, and quality, and place the carcass in one of the following grades: Prime, Choice, Good, Standard, Commercial, Utility, Cutter or Canner. The Choice and Good grades of beef or lamb are recommended for most consumers, since they assure the housewife of reasonably tender meat without an excess of waste fat.

Cook with dry heat

Other factors besides grade also affect tenderness of meat. Tenderness of meat is apparently affected by heredity in animals. Meat researchers report that fast gaining cattle tend to produce more tender beef. It is also probable that certain strains in swine tend to produce more tender pork.

Every consumer and especially everyone interested in livestock production should be concerned about quality of meat. Some day the producer may select certain families of cattle, sheep or swine which tend to produce more tender meat. The consumer should learn to recognize those qualities which make for more satisfying "meat".



Cook with moist heat

BETWEEN THE FURROWS

HORT CLUB

The Clemson Horticulture Club, traditionally a leader in horticultural student activities in the Southern region, extended its influence to the national level last summer. The Hort Club was represented in August at an Oklahoma State University meeting for the purpose of organizing a National Collegiate Branch of the American Society for Horticultural Science.

Representing both the local club and the southern region, Don Fox, graduate research assistant, Dr. Roy Ogle, Assoc. Professor of Horticulture and Jere Brittain, present chairman of the southern region, jointly led in this signal meeting.

Resulting from recommendations of this assembly, representing 30 states, a program of undergraduate research reports is planned for the 1961 meeting and each year thereafter.

The meetings are to be held in conjunction with the annual meetings of the American Society for Horticultural Science. The 1961 session is to be at Purdue University.

According to Jimmy Cothran, President of Clemson's Hort Club, about twelve Hort men will attend the February meeting of the Southern Region in Jackson, Mississippi. Jim Aitken will present a research paper in competition with delegates from ten other Southern States for a $100 award.

COLLEGE 4-H CLUB

The Clemson College 4-H Club iniated eight new members at the beginning of the semester into the Club. The Club has had some very constructive programs at the regular monthly meetings, and has plans for more activities and good programs in the future.

The Club was very honored to have four of the members accepted into the South Carolina Agricultural and Mechanical Society as life members. The South Carolina State Fair is owned and controlled by the South Carolina Agricultural and Mechanical Society.

Life membership was bestowed upon Rudy Bell, Bowman, S.C.; James Rozier, Moncks Corner, S.C.; James Gaddy, Dillon, S.C.; and Earl Robertson, Laurens, S. C.

LIVESTOCK JUDGING TEAM

The Clemson College Livestock Judging Team competed in the International Livestock Judging Contest in Chicago on November 26, 1960. The team left Clemson November 19 and worked out at colleges and farms in Tennessee, Kentucky and Indiana.

Members of the team were Bob Hunnicutt, Hartwell, Ga.; Rudy Bell, Bowman, S.C.; Walt McPhail, Seneca, S.C.; Millard Daniel, Clinton, S.C.; and Coach Dale Handlin, Assistant Professor of Animal Husbandry.

There were 37 colleges represented with 185 contestants from all over the United States. Outstanding members of the Clemson Team were Rudy Bell, who tied for 10th high individual in judging sheep and Bob Hunnicutt, who was 24th in over all judging. The team was 22nd.

BETWEEN THE FURROWS

(continued from page 9)

ADSA

In February, 1960, the Dairy Clubs of the souther agricultural colleges met in Birmingham, Alabama to organize a regional branch of the American Dairy Science Association. Meeting in conjunction with the Southern Agricultural Workers' Convention, representatives from the southern schools laid the foundation for expanded activities for dairy students. In addition to the social benefits of this effort, such a regional association can provide for closer student contact with current developments in southern dairy science, as well as for arrangement of graduate programs or employment in the industry.

Wayne Boone, president of the local chapter of ADSA, and the president elect, to be selected in January, will represent Clemson at the forthcoming second meeting of the regional group. This gathering is scheduled for early February, 1961 in Jackson, Mississippi.

BLOCK & BRIDLE

The Clemson College meats judging team participated in the 1960 regional meats judging contest, held November 13-16 in Baltimore, Maryland. Team members for the affair were Tom Barlow Harry Goforth, and Bobby Tripp. Earl Dudley and Dave Walker served as alternates. Sponsored by the local Block and Bridle Club, the Clemson team placed an overall tenth in the keen competition of fourteen teams. In beef judging, however, the Country Gentlemen emerged a creditable second. Harry Goforth was fourth high individual in beef judging. Professor D. H. Kropf coached the Clemson team and accompanied them to Baltimore.

FFA

Need extra cash? The Collegiate Future Farmers of America Chapter is sponsoring a work program for ag men who want to earn a few extra bucks during their spare time. The FFA acts as mutual aequaintance to bring together the interested student with individual professors, departments, or local businesses desiring additional help.

The program has already enabled numerous boys to gain both dollar income and valuable experience through part-time employment.

AGRONOMY CLUB

Five Agronomy Club members will be attending the National Convention of the American Society of Agronomy in Chicago, Ill. on December 5th. through the 8th. The official delegates to the student section are: Boyd Loadholt, junior from Allendale, S. C. and Edgar Lopez, senior from El Salvador, S. A. Also attending the convention are three seniors: Frank W. Crouch from Batesburg, S. C., Charles McLaurin from McColl, S. C., and Thomas L. Hucks from Aynor, S. C. After returning from the meeting delegates will report to the Agronomy Club on the highlights of the convention.

Meat Team Views Quality Lamb Carcass

HOW ABOUT HORTICULTURE

Jimmy Cothran, Horticulture '62

The primary dependence of man upon plants for food, fiber, shelter, and aesthetic value is generally recognized. Thus, horticulture, the art of cultivating fruits, vegetables, and ornamental plants, is perhaps the oldest Agrarian profession.

Until relatively recent years, the horticulturist has been rather limited by the whims of nature in his efforts to make the plant his obedient servant. With the dawn of the present "scientific era", there has unfolded a wealth of fundamental knowledge concerning plant processes. Such knowledge, placed in the hands of the horticulturist, becomes a great potential for more predictable and gainful culture of plants.

It is the objective of Clemson's Horticulture Department to resolve in some measure the problems associated with application of this knowledge "down on the South Carolina Farm". Let us see how the department functions in this respect.

To begin with let's consider research. Within the last few years, equipment to aid in the quest for more efficient and practical means of tackling daily horticultural problems has been added to this department. For instance, the Warburg Respirometer which provides an index of physiological activity of plant tissues, the Hunter Color Difference Meter through which the colors of fruits and vegetables may objectively be determined, and the flame spectrophotometer, an aid in measuring the nutrient content of leaf tissue, are all part of a combined effort to help farmers of the present as well as of the future.

Various research programs carried out by graduate students are also part of this effort. One such program has been the study of the effect of seaweed on the functions and processes of plants. There are also long-range programs to develope better and more productive fruits, vegetables, and ornamentals.

Ron Cowart, Hort Senior, shows his research project to Dr. Roy Ogle

One has only to be conducted through five busily employed greenhouses, a considerable acreage planted in grapes, peaches, pears and other horticultural crops, and a newly developed haven for the ornamental plants to realize the scope of this undertaking.

In close connection with the previously mentioned programs, there exists a new and most rewarding facility at Clemson--the trial garden. This garden contains annuals, perennials, and shrubs, as well as bulbs of various kinds. These various items are supplied by local as well as national organizations in an effort to provide the general public with products best adapted to this particular area as well as the most for their money. It is felt that this new addition will have measurable value in this phase of horticulture. (Continued page 16)

CLEMSON'S AMERICAN FARMERS

Charles D. Sparks, Ag. Edu. '63

At the National Convention of Future Farmers of America in Kansas City, Missouri, October 10-15, five Clemson College students received their American Farmer's Degree, which is the highest degree that can be obtained in the organization. They were James A. Boling, George Hugh Durham, James Jameson, George Paul Jones and Benjie Rhoad.

These students received this degree by working their way up through the steps of Green Hand, Chapter Farmer, State Farmer, and on up to the American Farmer's Degree. The qualifications for these degrees are set up by the National Organization.

James Boling, a member of the James F. Byrnes Chapter of Duncan, and the Clemson Collegiate Chapter of Future Farmers, does general type farming with his father. Some of his projects include beef cattle, dairy cattle, swine, corn and hay crops. He served his organization as James F. Byrnes Chapter Vice-President and Chapter President, Spartanburg Federation President, and State Secretary of the South Carolina Association. James now serves as Parliamentarian of the Clemson Collegiate Chapter. He received his award for his accomplishments in showing livestock and the keeping of outstanding records of his projects.

George Paul Jones, who is also of the James F. Byrnes Chapter and Clemson Collegiate Chapter, does general type farming on his farm which he is developing into a beef cattle farm. He served his organization as James F. Byrnes Chapter Treasurer and Clemson Collegiate Chapter Reporter. George Paul is now serving the Clemson Collegiate Chapter as Secretary. George Paul received his award for his accomplishments in farm electrification and showing of livestock.

A member of the Bamberg FFA and Clemson Collegiate FFA, Benjie Rhoad has served his organization as Reporter and President of the Allendale, Bamberg, Barnwell Federation, and State President of the South Carolina Association of Future Farmers. Benjie does general farming with his father. Some of his projects include swine, dairy calves, corn, soybeans, and small grains. Benjie received the Star Farmer Award of his local chapter and the Individual Future Farmer Award of District Four. He received his American Farmer's Degree by virtue of his records in supervised farming and his outstanding leadership.

Hugh Durham, who is from Piedmont, South Carolina, does general type farming, and some of his projects include dairy and beef cattle, corn, and small grains. He is a member of the Wren FFA Chapter and Clemson Collegiate FFA Chapter. Hugh has served his organization as Chapter President, Federation President, and Treasurer of the South Carolina Association. Hugh won the Tri-State Public Speaking Contest also. For his outstanding records and leadership in his organization, Hugh was awarded the American Farmer's Degree.

James Jameson, a member of the Pendleton FFA Chapter of Pendleton, South Carolina, does general type farming on his father's farm. He raises and shows dairy cattle. James has won state honors in fitting his animals. He has served as President of his local chapter and Treasurer of his Federation. He was awarded the American Farmer's Degree for his outstanding work with his dairy cattle and his chapter.

FOREST FACTS

Bill Goodman, Forestry '61

The standard of living in a country is highly correlated with the amount of paper it uses. Since the United States is the greatest user of paper - which is made of wood grown in the forest - we conclude that we enjoy a high, if not the highest standard of living in the world. We also conclude that much wood must be grown to supply the raw materials needed for this paper and other forest products. Furthermore, we are compelled to assume that a large forest acreage is required to grow the needed wood. But where does this lead us in terms of forest research at Clemson?

It would be fallacious to believe that paper production is the sole purpose of forestry in the South. However, paper is a major forest product, especially here in South Carolina. For this reason, production of paper is used in this discussion to make a point concerning the subject, forestry research.

Suppose our population were doubled and, simultaneously, our total forest area were cut by 1/3. We would be hard pressed to maintain our present flow of forest goods and services much less provide for a doubled need for these forest products. By the year 2000, we expect our population to be doubled, thus doubling the need for goods and services stemming from the forest. The anticipated need for more roads, a more intensive network of power lines, more residential areas, more reservoirs will reduce our present forest acreage by 1/3.

Our suppositions may seem far-fetched. And yet, since they are predicated on findings of well-conceived surveys, we must take them seriously. What can we do about them?

There are many ways in which we can improve our forests. Some are: establish the desired species on its best sites, i.e., the best kind of tree on a given location; improve growth conditions where a poor growth rate now exists; establish full stocking on areas which are now understocked. These are but few of the ways leading to the improved production of our forests.

However, we are not so sure how to accomplish these ends. There are still many questions left which only an extensive forest research program can answer.

This is going to cost money! It's going to take a great deal of time. In a state like South Carolina, where 62% of the total area is in forest land and 77% of this is in small landowners' hands, it becomes evident that there are not many forest landowners who can afford this kind of research program.

The Clemson College Department of Forestry is working in cooperation with various agencies, such as the South Carolina State Commission of Forestry, Atomic Energy Commission, Soil Conservation Service, and the U.S.D.A. Forest Service. Twenty-three projects and experiments, designed to maximize the "plus factors" in forestry and minimize the "minus factors" are being carried out for this purpose.

Various projects are concerned with: Site preparation on land occupied by kudzu, sericea lespedeza; seed production; direct seeding versus planting; nursery work; shading and mulching of seedlings; field survival and growth of pines and hardwoods; fertilizing of plantations; replacement of undesirable tree species with desirable ones.

Through these projects, the answers to some of the foregoing questions will be found, thus providing the scientific foundations for practices leading to proper selection of species, improved growth conditions, and increased stocking. All of these factors will contribute to the increased quantity and quality of forest products, upon which we have become so dependent, both as producers and consumers.

THE PRESSURE IS ON HAY

Kenneth R. Butcher, Dairy '62

Most of you have heard or read something about the pelleting of hay. In the past five years, considerable interest in this subject has been shown. Also, the development of Costal Bermuda has aroused interest in both beef and dairy feeding circles in the South. However, some dairy farmers in the South have become discouraged with results obtained from feeding Coastal Bermuda hay to their heifers and cows. Realizing this problem, some of the members of the Dairy Department here at Clemson are conducting research on the feeding of Coastal Bermuda hay to dairy cattle. Through the help of information given to me by Mr. Glen O'Dell of the Dairy Department, I should like to tell you about some of the work that he has done, as well as some of the work he now has in progress on the feeding of pelleted Coastal Bermuda hay to dairy heifers and cows.

Before starting his research on pelleted Coastal Bermuda, Mr. O'Dell compared the costs of baled alfalfa and pelleted Coastal. The average cost of alfalfa last year in the Clemson area was approximately $50 per ton, while $30 per ton was the average figure for Coastal. Since the cost of pelleting ammounted to about $10 per ton, the total cost of the pelleted Coastal was approximately $40 per ton.

Subsequently trials were conducted to compare the effects of baled to pelleted Bermuda on the growth of yearling heifers. The roughage required per pound of gain was higher for the pelleted Coastal Bermuda group, but from an economic standpoint the feed cost per pound of gain was considerably less. The pelleted Coastal group showed an average gain of 0.5 pound more per day than did the baled Coastal group.

At the present time, Mr. O'Dell is starting this same type of work with groups of cows in the Clemson herd to determine the effects of pelleted Coastal Bermuda on milk production. Many of the dairy farmers of South Carolina are looking forward to the results of this research. More pelleting of hay will be done if experimental evidence continues to be favorable toward pelleting, and if the cost of pelleting equipment is reduced.

OPPORTUNITIES IN AGRIBUSINESS

William R. Clayton, Ag. Ec. '62

Agribusiness, a relatively new term, is now used extensively to describe all the interrelated functions of agriculture and business. Agribusiness has been defined as "the sum total of all operations involved in the manufacture and distribution of farm supplies; production operations on the farm; and the storage, processing, and distribution of farm commodities and items made from them". Thus agribusiness encompasses all the functions which the word agriculture denoted a century ago, plus some others.

The above definition denotes many things but above all it sets forth clearly the many opportunities present in the now very broad field of agriculture. It means, for example, that more and more young men with training in agriculture and business are needed to fill positions of many different types in this ever expanding field.

Studies conducted by the nation's agricultural schools show that on the average a larger percentage of agricultural economics graduates are employed by governmental agencies than by commercial or educational interests. This is not surprising since many of the so called "action agencies" in the USDA are engaged primarily in the agribusiness field. The indications are that an increasing number of qualified persons will be needed in these fields. Agricultural economists in particular are needed in such agencies and organizations as the Federal Land Banks, the Production Credit Associations, the Rural Electrification Administration, the Employment Security Commission, the Foreign Agricultural Service, the Crop Reporting Service, and the Farm Economics Research Division. The various state agencies likewise have need for men and women trained in agribusiness.

More and more privately owned banks have adopted the practice of employing agricultural economics graduates to supervise their agricultural loan departments. Demand for persons to fill these positions will become greater as farming becomes more commercialized, thus calling for greater investments and more careful consideration of the efficiency of production.

In the marketing field, agricultural economics graduates are finding that there is plenty of room for well-trained young men. Meat packers, fruit and vegetable wholesalers, and all types of buyers of agricultural raw materials are eager to employ aggressive persons for buyers and salesmen. Manufacturers of agricultural implements, farm supplies, and fertilizers are the main employers of graduates for sales work.

Public relations for large agricultural supply companies is another phase of the work done by agricultural economics graduates. Many in this field spend much time writing articles and speaking on agricultural subjects of general economic and social concern.

As production units become larger, better management must be in evidence if farms are going to be operated with a high degree of efficiency with maximum profits being obtained. Owners of these large, commercialized farms are going to look for the best trained, highest qualified managers available, and many of these responsible positions will have to be filled by college graduates. Here too, the agricultural economics graduate is in an extremely favorable position.

(continued page 16)

HOW ABOUT HORTICULTURE

(continued from page 11)

Located at strategic positions in South Carolina are field branches of the Experiment Station. Here, emphasis is placed upon investigation of horticultural problems pertaining to the surrounding region.

Through its extension arm, Clemson's Horticulture Department is kept in continuous touch with the state's horticultural industry. Specialists in fruits, vegetables, and ornamentals convey to local extension agents pertinent information and recommendations, based upon research findings. Through the same channel, unique problems are referred to the research staff, sometimes resulting in special research endeavors.

A third, and by no means least important, aspect of Clemson Horticulture is the teaching at both the undergraduate and advanced levels. A versatile and constantly growing educational program trains horticulturists to fill positions in production, processing and distribution, and allied academic pursuits.

Outside "the arena of the classroom", as aptly expressed by Professor Goodale, students and staff members of the Horticulture Department meet in the Horticulture Club, where lasting personal friendships are formed.

From these observations, it may be concluded that the horticultural future of South Carolina is indeed bright. As plants and plant processes are better understood through research, both producer and consumer will reap such benefits as larger and higher quality fruit, vegetables especially adapted for fresh market or processing and ornamental plants of greater utility and beauty.

AGRIBUSINESS

(continued from page 15)

The expansion of work in the field of community development likewise will increase opportunities of men and women with good training in agricultural economics and rural sociology.

Agricultural economics training in colleges today is of a broad nature, encompassing not only basic agricultural courses but also specialized courses in marketing, management, pricing, policy, and financing. This type of broad,well-rounded agricultural and economic training makes agricultural economics graduates qualified for many varied production management positions.

All in all, the field of agribusiness needs competent, well-trained, qualified persons so that it may thrive and do so efficiently. College graduates in agricultural economics will be able to fulfill these requirements and will be well rewarded for their efforts and training.

FARM FACT

In the 1960 crop year, the U.S. Farmer has produced enough food, fiber and tobacco for almost 24 persons, according to Agriculture Department estimates. In 1955 he produced enough for 20 persons, in 1950 for 16, in 1940 for 12, in 1930 for 11.

FARM FANCY

I am only an average man but, by George, I work harder at it than the average man.

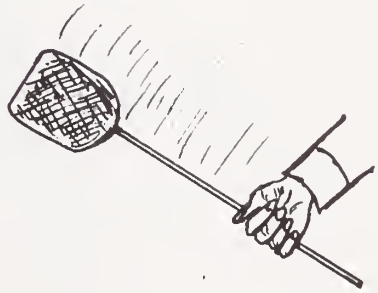
Theodore Roosevelt

LET'S SWAT THE "FLY-BY-NIGHTERS"

Tim Drake, Ent. '61

In the past fifteen years the legitimate termite control business has grown steadily, but along with it the illegitimate form of this business has also flourished. Although there are no state pest control laws in South Carolina, the reputable companies have to establish and maintain a good reputation in their operating territory in order to stay in business. There are several reasons why the illegitimate companies are still operating. One of these reasons is because all that is required of the fly-by-nights in South Carolina is that the company purchase a city license in every city in which they operate. This leaves the field open for anyone who has a truck and other necessary equipment to go into business for himself.

Another factor that has influenced the large number of "fly-by-night" operators is the high-income low expense of operation. They do nothing that cost any money to speak of except maybe to spray some burnt motor oil or creosote around under the house. Contrary to public opinion, there is much expense connected with legitimate pest control operations. Here, money is constantly being paid out for labor, transportation, chemicals, equipment, insurance, bonding, advertisements, and many other miscellaneous items. If the illegitimate operators would do the job right the field would be less profitable for them, and thus we would have less cause to worry.



The last factors, but by no means the least important ones, are the public's ignorance and the desire to get something for nothing. Most of the victims of these unscrupulous characters are older people who do not know about this racket, and people who think they need the service of an exterminator but can't afford it. These operators prefer to pick on older men and women, because there is less chance of the owner following them around under the house and asking embarrassing questions. In some instances these men may take their own termites under the house so that they can show the home-owner "proof" that his house is being eaten and will soon fall down. The home-owner usually will not question the integrity of the men and thus another sucker is hooked. These characters usually charge more than a reputable company and certainly do nothing to earn the money. If the purchaser would take time to consult a reputable company they would discover that in almost every case the cost would be less than that of the "fly-by-night" operators.

AGRICULTURAL ENGINEERS MEET IN MEMPHIS

The winter meeting of the American Society of Agricultural Engineers was held December 4-7, 1960, at the Peabody and Chisca Hotels in Memphis, Tennessee. Students representing the Clemson College Student Branch were: Lindsay L. McElwee, club reporter from Clover, S.C.; John M. Carpenter from Easley, S.C.; James C. Henderson from Greenville, S.C. and Faculty Advisor Dr. H. E. McLeod. Seventeen Student Branches were represented at this meeting. The programs were divided into four concurrent sessions: Power and Machinery, Electric Power and Processing, Soil and Water, and Farm Structures. A Personnel contact session was held one afternoon to give the students an opportunity to interview Companies interested in Agricultural Engineers. An educational Atomic Energy Exhibit was on display the entire week in order that everyone might see the uses of Atomic Energy as applied to Agriculture.

Papers were presented by several former Clemson College Students. R. A. Shoolbred with Portland Cement Assn., presented "Hyperbolic Paraboloid Roofs" and Dr. H. E. McLeod, Dr. J. H. Anderson and Joe E. Clayton presented "Basic Investigations in Vibratory Harvesting".

FARM FACTS

U. S. farm population underwent a decline of 15.5% during the 1950-59 decade. The total population as of April 1, 1959 was 21,172,000. This decline occured in all U. S. regions and divisions.

Of the $313.8 billion spent by Americans for consummer goods and services in 1959, the largest item was a record $85.2 billion for food and tobacco.

IRRESPONSIBLE ERADICATOR

(continued from page 17)

In the past several years I have learned of many cases where people have fallen prey to these men. In one instance an elderly lady was visited by one of these exterminators on three different occasions and was taken for nearly thirteen hundred dollars over a period of several years. Finally the house had to be treated by a reputable company because the termites were swarming all over it. The cost - one hundred dollars! Think how much money the poor lady would have saved if she had called a reputable company to begin with. It is your job and mine to keep these unscrupulous characters from swindling the home owners of South Carolina. The least we can do is to make sure they don't get any of our money. If a smooth-talking "termite-man" comes to your house, unless he can produce sufficient identification to prove he is from a reputable company, send him away. Next, call your local exterminator and ask for a free estimate on your house - you may be glad you did.

AGRARIAN PHILOSPHY

I ain't ner don't p'tend to be,
Much posted on philosofy;
But thare is times when, all alone,
I work out idees of my own.
And of these same thare is a few
I'd like to just refer to you--
Pervidin that you don't object
To listen clos't and rickollect.

James Whitcomb Riley

One of our biggest problems these days is working out solutions for the solutions the last generation worked out.

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THE AGRARIAN

Published each semester by the undergraduate agricultural students, Clemson College, through the Council of Agricultural Club Presidents. Opinions expressed in this magazine do not necessarily reflect the policy of the School of Agriculture or Clemson College.

THE COVER

Miss Judy Allen of Startex, S. C. awards Champion Livestock Showman, Joe Hughes during Little International. (Clemson College photo by Jack Hurley).

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Alpha Zeta
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Clemson College 4-H Club
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Eta Zeta
Forestry Club
Horticulture Club
Kappa Alpha Sigma
S. C. Crop Improvement Association

THE AGRARIAN gratefully acknowledges the assistance of Brenda Merck, Joanne Brittain, Carolyn Carland, and Myra Musser in typing the manuscripts.

Volume XVIII April 1961 Number 2
CLEMSON COLLEGE, CLEMSON, SOUTH CAROLINA

FROM THE DEAN'S DESK

Welcome High School Seniors:

Congratulations on your choice of Agriculture as a career! You will note that the writers of THE AGRARIAN share your confidence in the future of this profession.

We look forward to your joining us here at Clemson next fall. While we are sure that the attainment of academic excellence will be your foremost objective, let us encourage you to become associated with your professional club as early as possible. You will surely find the fellowship with students and staff members in club activities one of the most memorable and rewarding experiences of your college career.

If you are interested in writing, photography or other phases of agricultural journalism, THE AGRARIAN solicits your talent.

The Agrarian

The Vision

"In the beginning there was an idea and it was nurtured and it grew and grew until it blossomed forth," into Clemson College - 1961.

Should Mr. Clemson return for a visit today, his home would not be too different; however, around the mansion are many changes. Buildings, paved streets, motor cars, Hartwell Lake, different, yes, but not too surprising to Mr. Clemson. He dreamed of change, of science, and a better way of life.

He dreamed of an educational college capable of training the minds of young men in the truths of science. These were just beginning to unfold during his lifetime.

Agriculture today would be of great interest to Mr. Clemson, and especially these three new fields open to agricultural students. Science, where chemistry, mathematics, physics, bacteriology, botany, entomology, zoology, and medicine play such important roles; Business, the art of management, marketing, equipment and supplies, all important in the business world of today; and Production Technology, where students learn the principles of scientific agricultural production in the light of modern technology.

Clemson College thus fulfills his dream of educating young men to take their places of leadership in agriculture. Truly today, there are dynamic careers ahead for students who choose agriculture at Clemson.

BEEN STUDYIN' IT OVER..

. . . . And we've come to wonder about the future of THE AGRARIAN.

In publishing this second edition the members of Clemson's Agricultural clubs, through the Agricultural Council, have clearly demonstrated the feasibility of continuing THE AGRARIAN. We are gratified by the favorable response to the past issue, both within and beyond South Carolina.

However, resources of most student clubs are very limited. It is improbable that future publications can be assured without some form of underwriting or subscription.

The South Carolina Crop Improvement Association has generously sponsored the present issue. We sincerely extend our gratitude to this organization. The participation of other agricultural organizations will be welcomed.

Would it be unreasonable to look also to Clemson's Agricultural Alumni for this needed stability? If a substantial proportion of these agriculturists should make a nominal contribution each year, the continued publication of THE AGRARIAN would be assured. Contributing Alumni would of course receive copies of each issue.

Should funds accumulate in excess of publication requirements, an AGRARIAN SCHOLARSHIP might be established.

Not only would this effort be valuable in terms of promoting agricultural journalism; THE AGRARIAN could thus become an effective disseminator of agricultural alumni news.

The funds could well be administered by a permanent board of faculty advisers together with the AGRARIAN student staff.

The present editorial staff, most of whom expect to become alumni in June, have agreed to contribute five dollars each as evidence of their sincerity in this proposal.

Who will join us? We will be grateful for your contributions. Checks may be made payable to the AGRARIAN and mailed to Room 144
P & AS Building
Clemson College
Clemson, S. C.

WHO SHALL JUDGE?

Effective teaching is the subject of perennial interest to all those associated with the educational process. Most sections of the recent Southern Agricultural Workers' Conference turned aside from their research reporting long enough for discussions relating to college teaching. There is within the School of Agriculture a committee designed for the study of teaching materials and methods. The recent modifications of the various agricultural curricula further witness the seriousness with which Agriculturists approach the teaching of the AGRARIAN sciences and arts.

These conferences and command decisions notwithstanding,, the question of effective teaching must finally and fundamentally be posed at the classroom level. For it is here that the teacher might implant in the inquiring mind the seed of knowledge. Implant he may, but, strange to say, the same teacher who expounds the virtues of proper nurture for newly planted corn may paradoxically ignore the nurture and cultivation of his newly planted knowledge. This might represent the teacher who "couldn't care less whether they get it or not---they're grown men now". (Continued page 16)

GROW SMALL FRUITS

Dennis A. Abdalla
Horticulture

If you're a commercial grower or home gardener and haven't tried growing small fruits, then it's about time you do! Strawberries, grapes, blueberries, and brambles are adapted to almost every state in the union, and are relatively easy to grow. With proper cultural practices, the commercial grower can add many dollars of profit to his income; similarly, the home gardener can add many new delacacies to his table along with improvement of his home grounds.

South Carolina is adapted to many of the small fruits, especially in the Piedmont area. Grapes are now on the increase with the formation of the Palmetto Grape Growers Association and the construction of the new grape processing plant in Spartanburg County. This offers a ready market for any prospective grape grower. The Concord variety, which is used exclusively by the processing plant, grows well and with proper cultural practices can produce 5-8 tons per acre. Grapes for juicing are bought on a basis of the sugar content at maturity with 16% being the base for initial payment.

The home gardener can use any number of varieties such as Concord, Delaware, and Niagara which are blue, red and white grapes respectively. These are fine for eating, jelly making, or juice. With proper use of arbors and trellises the grape can offer beautiful yard and garden utility. Shade and fencing are examples of landscape use.

For optimum annual production grapes must be pruned, fertilized, and sprayed every season, but if done properly these can prove to be relatively easy chores.

The muscadine type of grape is very well adapted to South Carolina's climate. Best suited to home gardens, they produce large, single, juicy grapes rather than a bunch-type cluster. Muscadines are excellent jelly makers, with Thomas, Scuppernong, and Hunt being good varieties.

Strawberries are probably the easiest of small fruits to grow, and many varieties do well in South Carolina. Dixieland, Pocahontas, Tennessee Beauty, and Albritton are a few. Planted in a matted row system and kept free of weeds, they are prolific bearers capable of producing 5000 quarts per acre yielding a gross of up to $3,000 per acre. One planting will give optimum yields from 3-4 years and with proper runner control, rejuvination is quite simple. They require some fertilization and occasional spraying for spider mites and foliar diseases.

On the home grounds strawberries give the ever popular "strawberry-short-cake" all season long, while jams, jellies or just plain strawberries and cream from your own garden are unbeatable.

Another use for the strawberry is as a ground cover. Their dark green, dense foliage, with an occasional bronze leaf, is a picturesque sight.

(Continued page 16)

WHAT'S YOUR DOUGH DOING ??

William R. Clayton
Ag Ec, '62

Why keep farm records? Certainly, as any wise farmer knows, records of his farming operations should be kept. There are many good, sound reasons for keeping records but they all point to one main objective -- increasing the individual's earnings.

The farmer, whether a large or small operator, can be aided by accurate records in a variety of ways. Records show clearly a history of the farm's performance from year to year including such data as the yield of each crop, the dollar value of each crop, the gross and net income of the farm, and the net value of the business at the beginning and end of each year. Such facts as these, which become more valuable the longer the records are kept, can be used as management guides and can definitely aid the farmer in the control of his business.

Since each farm has its own special problems, it is important that facts concerning production requirements and yields be analyzed by the farm manager. These facts can be obtained only from accurate records; rough estimates or guesses will not suffice.

Other than the general uses of farm records stated above, there are several other specific uses. One of these is the use of records to provide information for the settling of accounts with creditors and debtors. Such records are definitely needed on farms where there are share croppers or tenants. If a farmer can show a well-kept set of records, he is likely to make a more favorable impression when applying for a loan at a bank or other loaning institutions. Without accounts and records the farmer may have trouble convincing the prospective creditor that he is a capable farmer and is in a position to use the credit productively.

Records can also be used in establishing bases and allotments for participation in government programs. Much time and effort in qualifying for a crop control or soil conservation program can be saved by the use of accurate records of crop acreages and production.

Finally, in order that income tax returns be completed properly it is necessary that accurate records be kept. When estimating net income for the year, the farmer is apt to over-estimate since he will remember the large sales transactions but will forget many small expenses which could be deducted on his income tax return. So-called minor expenses such as oil, nails, or nuts and bolts, can add up to a sizeable annual total. A practical way of keeping good records of expenses is to do as much business as possible by check. In this way check stubs can be referred to and can give much information concerning expenditures.

Today, more than ever before, record keeping in the farm business is an essential of proper farm management.

Date	Kind of expense	Labor hired 1	Crop expense 2	Livestock expense 3	Feed bought 4	Fuel and oil for farm use 5

Date	Kind or receipt	Sale of crops			Sale of livestock raised	
		Cotton and cotton seed 1	Grain crops 2	Other crops 3	Cattle 4	Other livestock 5
		$	$	$	$	$

FOREST PHILOSOPHY

T. E. Blackwell
For., '62

Shirley Walter Allen, Professor of Forestry at the University of Michigan defines forestry as "a science, and art, a business, and a public policy capable of, and occupied with, effecting continuous production and management of forests on suitable lands and promotion of their beneficial use by mankind". Forestry is a heritage of keeping the woods productive. I like to think that when God made the first tree he knew that through the centuries trees would be a nesting place for birds, a refuge for wild creatures, a holder of the soil and an element that would provide for the comfort and spiritual revitalization of man.

A forest is an entity, a being, in that it seems to have endless patience with destructive man. Man acts as though he hates the trees. He destroys them by fire and other means, and yet the forests spring back time and time again giving man the opportunity to alleviate his sins against them.

Forestry is the profession and calling to keep these forests productive and beautiful. You might say that a forester is an envoy, a missionary if you will, of this forest being. It is up to him to see that the people of the world know the value that exists in their forests and that they utilize and protect this priceless treasure.

The city dweller, and I am one myself, is inclined to regard the forest as a place where "Smokey the Bear" roams unmolested and where giant virgin stands of timber rise against the sky.

To be sure, this is in error. Only a very small percentage of the total timber in the United States is virgin timber. The rest has to be managed intensively by highly skilled technicians and scientists known as foresters. Therefore, the concept that seems to have lodged in the public's mind that a forester is a man in a green suit with a black tie, riding boots, and an old-timey boy scout hat, whiling his time away in some deserted portion of the forest in a fire tower, is entirely in error. As a matter of fact, the ones who do this are known as fire guards or wardens who are sub-professional men. These are very important men and without them the forests would be in bad shape. However, they should not be confused with foresters who are graduates of a four year curriculum in forestry and whose main concern is with the over-all management of his woods rather than a narrow field. (Continued page 13)

POLE FRAME HOUSE

Lindsay L. McElwee
Ag. Eng., '61

In recent years pole frame construction has become one of the most popular types of structural framing for farm service buildings. Pole frame construction has been used for animal and poultry housing, machinery sheds, storage sheds and many other types of shelters. The uses of pole frame construction are virtually unlimited; new structures using this method of construction are being built every day. This system is also adaptable for building inexpensive farm homes.

ADVANTAGES OF POLE FRAME CONSTRUCTION

Pole frame buildings are easy to construct, even on very irregular or sloping grounds. Foundations are less expensive. No scaffolding or forms are required; therefore, regular farm labor and tools may be utilized. Erection is rapid, since the foundation and framing are completed in one operation. Cost is low, relative to conventional types of construction. By using properly pressure treated poles and lumber, a life expectancy of more than fifty years may be expected.

DESIGN FOR ECONOMY

A simple pole frame house can be constructed very economically by using farm labor and tools. Almost any simple designed floor plan can be adapted to pole frame construction. But to minimize cost a rectangular shaped floor plan 26 to 28 feet wide is recommended. Stock rafters 16 feet long and 14 foot floor and ceiling joists minimize waste. An economical system is to use floor joists, ceiling joists, and trusses spaced two feet on centers.

The basic structure must be sound and planned for remodeling ease. All windows and exterior doors should be standard sizes. Multi-purpose rooms are a must for low-cost housing, such as kitchen-dining room, and kitchen-family room-dining room combinations. Attic space provides much storage area or may be used for bedrooms. Insulation should be used especially in the attic.

Trusses and gable ends may be fabricated on the ground and lifted in place by means of the hydraulic lift of a tractor. This saves much time, labor and scaffolding. A simple, clear-span, gable roof should be used for economy.

Structural-insulation type sheathing-sheets save labor, cost less than conventional sheathing, and have at least twice the insulation value.

Exterior walls may be covered with exterior plywood, asbestos cement board, embossed corrugated aluminum,or wood siding. The plywood should be treated with preservative for longer life expectancy. Interior walls can be finished by using sheetrock, interior plywood, or wood paneling; sheetrock is the most economical.

A prefabricated plumbing wall is very important for bath room and kitchen because this eliminates costly tearing out and replacement of materials. Pipeless furnaces are much cheaper than piped systems. Wood burning stoves and space heaters are well suited for economical housing.

Kitchen cabinets of stock sizes should be used to minimize cost and reduce time and labor.

The roof can be covered with asphalt shingles, aluminum, or any suitable roofing material. Finishes for interior walls, exterior walls, ceilings, floors, and roofing materials should be selected by the individual to suit his tastes and his bank account.

PROF GOODALE PROGNOSTICATES

B. E. Goodale
Head, Dairy Department

Editor's Introduction

Speaking before the general session of the 1961 Southern Agricultural Worker's Convention, Jackson, Mississippi, Clemson's "Dean of Dairying", Professor B. E. Goodale, recently outlined his appraisal of the next ten years in southern dairying. Professor Goodale, currently is serving as Chairman of the Southern Region, American Dairy Science Association. He collaborated with other Heads of dairy departments throughout the South in arriving at a projected view of the dairy industry. A resume' of his speech follows.

CHALLENGING PROBLEMS AHEAD

Better Dairy Farm and herd management practices must be developed. Low production per cow is blamed too often on breeding when it may be largely feeding and management.

Much more attention must be given to the newer knowledge concerning year-round pastures and stored high quality forages. More agronomic research is an urgent need to develop higher quality feeds for dairy cattle.

The plant breeder whose research can produce a new high quality legume perfect in all ways for Southern conditions and a new permanent grass, palatable over a long season; or anything which a cow will drool over and make cheaper milk flow freely - that plant breeder will be the patron saint of Southern dairymen.

Dairy labor continues as a major problem. Good men who are willing to learn and to work are hard to find and hard to hold. We will try to teach them to love the dairy cow and make dairying a life-time job. We must slowly create a proud heritage of dairy experiences among our working people.

Artificial insemination is not developing in all areas of the South as it should.

Until Artificial Breeding Services become available to more dairymen over all the South, we will be forced to trail behind leaders who reap the benefits of techniques proved by scientists to be economical and effective. This is not a panacea to cure the ills of bad management, but the system fits well into our South-wide program of breeding better dairy cattle. Tie this to a management program that will give our cows the opportunity to produce to their genetic potential, and we are well on our way.

A study of farm buildings over the South with our friends from Agricultural Engineering can prove to be profitable. A great number of farm buildings planned by the dairy farmer and built by farm labor do not always fill the requirements of efficient mechanization. Time and motion studies used so long in industrial operations have been found to be just as useful on the farm. (Cont. page 9)

CHANGES EXPECTED BEFORE 1971

1. The National Sanitation Act may be passed long before 1971 after amendments to proposed act are made. When enacted into a law, barriers will be removed which now restrict movement of milk meeting the standards of Grade A milk as defined by the U. S. Public Health Service, in states and municipalities having higher standards. Many of our Southern towns, cities, and states have higher standards than the milk code of the U. S. Public Health Service.

2. The cracked crystal ball indicates the possibility of more State and Federal controls on dairy products and perhaps on producers.

3. Further advances in dairy equipment improvement are coming with more emphasis on automation.

4. Early in the decade under discussion, demand for milk fat will decrease but consumption of solids-not-fat will increase.

5. Increasing emphasis on solids-not-fat will require a change in our pricing structure and a re-directed stress placed on our breeding program.

6. Employees working with the milking herd who are responsible for raining production goals may be startled by the 400,000 pounds of milk requirement per man per year which has been set by some areas. This has already been accomplished and surpassed by some dairy farms over the South, but too few. Before the end of 1970, full proof of the 400,000 pound and higher goals will be widely accepted.

7. Dairy labor will become more specialized and more costly during the sixties, and may become unionized in a number of areas.

8. Large chain super-markets will build more dairy plants in the South. Private brand dairy items will increase rapidly in the early sixties.

9. The flurry of promotions for low-calorie, unpalatable, pseudo dairy drinks will subside and settle down to mainly standard skimmilk products.

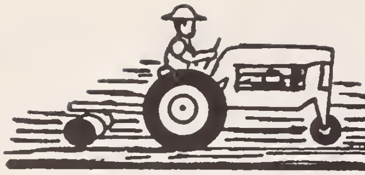
10. The old crystal ball indicates less distinctly that one standard grade of milk will be sold by producers in the future. Governmental actions may speed this change. The problems involved are rather obvious to dairy specialists, but in this world of perpetual innovations the unexpected change often becomes a workable reality.

11. In many areas less feed nutrients will come from grazing and more will come from specialized stored feed systems. We will learn much more about handling cows in large units and especially in dry-lot units.

12. There will not be much chance of a general increase in price of milk paid to producers. More efficiency in all operations is apparently their only possibility of getting more net return on their investment if changes in marketing methods are not feasible.

13. Competition from lower priced Grade A milk from other sections is a sure bet. Implementing such competition will be shipments into the South of a variety of canned and packaged Grade A concentrated milk. The latter when reconstituted will be sold at a price advantage made possible by savings in cost of transportation because the fresh whole milk is three or more times bulkier and is heavier.

14. In order to get milk production averages over 10,000 lbs. in herds all over the South there will be breeding programs in most all areas using production-proved bulls. Artificial Insemination programs using proved sires will spread rapidly. (Continued page 13)



BETWEEN THE FURROWS

Block and Bridle:

On April 8th the Block and Bridle Club held its annual Little International livestock judging and showmanship contest. During the morning the club members competed in a showmanship contest with cattle, swine, and sheep. That afternoon the club played host to 4-H and F.F.A. teams from throughout the state, along with interested college students, as they competed in a livestock judging contest. The day was concluded with the annual Block and Bridle Club banquet where awards were presented to the club members.

Bob Hunnicutt was awarded the coveted Merit Trophy for his Block and Bridle activities.

On March 23-25 the Junior Livestock Judging Team attended a livestock evaluation clinic in Atlanta, Georgia. In absence of their coach, Dale L. Handlin, they were accompanied by Dr. R. F. Wheeler, Head of the Animal Husbandry Department.

Miss Little International, Judy Allen, awards showmanship of Butch Kennedy. Block & Bridle President, Bob Hunnicutt, observes.

Alpha Zeta:

The South Carolina Chapter of Alpha Zeta will initiate 12 new members during the spring semester. Sophomore Joe Hughes, National FFA Officer, leads the undergraduate candidates scholastically with a 3.76 GPR.

Dairy Club:

Jim Caughman was recently elected to serve as the first chairman of the newly formed Southern Section, ADSA. Folks down Lexington way can rightly be pleased with their native son. The selection comes as no surprise to Jim's Clemson friends. He's active in a half dozen organizations, including Alpha Zeta, the Dairy Club, and Pershing Rifles, while sporting a 3.5 Grade Point Ratio.

Dean Heads Southern Ag. Workers

Dr. M. D. Farrar, Clemson's Dean of Agriculture has been elected Chairman of the Association of Southern Agricultural Workers for 1961. This organization is composed of the research, teaching, and extension workers throughout the several southern states.

Dean Farrar has headed Ag activities at Clemson since 1953.

Ag Ec Club:

A new project is being undertaken by the Ag Ec Club this semester. The Club is in the process of publishing a News Bulletin. The purpose of this publication is to present information that concerns the Club, the Department, and the field of Agricultural Economics in general.

Hort Club:

Clemson's Hort Club is again represented by an officer in the Southern Region. Jim Aitken, an "indoctrinated" Floridian, was elected to serve the region as secretary during the current year. Jim will be playing an important role in the organizational meeting of a National Collegiate Branch of the American Society for Horticultural Science. This meeting is scheduled for August at Purdue University.

Ron Cowart, a January graduate of the Hort Club, has begun work on his Master's Degree. He's staying with Clemson - working on chemical thinning of peaches.

Ag Eng:

Seniors Gerald Brooks and Luke Nance are planning graduate work in Ag Engineering. Gerald has a Ginning Engineering Fellowship from the Cotton Council. Luke is looking into tobacco mechanization work at N. C. State.

Gamma Sigma Delta:

Gamma Sigma Delta, honorary agricultural fraternity, has **elected** the following seniors and graduate students to membership. Selection is based primarily upon academic achievement.

Seniors
C. W. Boone
J. A. Brittain
J. D. Mills
J. H. Ryan
J. M. White

Graduates
J. O. Black
R. N. Boatwright
F. B. Cates
J. E. Cox
D. F. Fox
S. C. Gambrell
L. C. Hamilton
E. H. Hudson
J. W. Kelly
J. B. Kissam

How To Eat An Apple

Liberty Hyde Baily gave this formula for maximizing the pleasure of his favorite fruit - THE APPLE.

"Hold one in your hand....note its size and shape. See the slight blush on the cheeks and the tones of green than run from bottom to top. Put it to your nose and inhale the fragrance. Hold it at the hollow of your cheek. Now eat it. Do not cut it or slice it, but eat it. Feel the break and crack of its cool crisp flesh, the flow of its sprightly juice, and get the aroma that lies at the very heart of it. At last you have eaten an apple."

Senn Heads Horticulturists

All "alumni" of Hort. 201 will be pleased to hear that Dr. T. L. Senn is serving as Chairman of the Southern Region, American Society for Horticultural Science. Word has leaked out to THE AGRARIAN that Clemson's Head Horticulturist will probably choose RESPIRATION as the topic of his presidential address next year.

HERE'S TO THE HEXAPODS

Bruce Wallace

Entomology is the science that deals with the study of insects. There is very sound reason for this study when you consider that there are over 80,000 different species of insects in the United States alone and more than 700,000 species in the world. This does not take in related ticks, spiders and mites.

To many, entomology offers a very interesting hobby. However, it is a full time profession for over 5,000 men and women in this country. They are engaged in many different branches of entomology such as teaching, research, pest control, quarantine inspectors, and selling of insecticides.

You may ask yourself, "How is this science important?" Well, when we consider that insects do around four billion dollars' damage annually in the United States alone, then we realize the importance of entomology. We have all been annoyed by mosquitos, flies, termites, clothes moths and numerous other insects.

There are many phases of insect control. Some of them are: use of chemicals, use of natural predators, use of pest resistant plants and any other means of reducing harmful insect populations to a minimum. Physiology is the study of body functions; taxonomy is the identification of insects; toxicology concerns effects of poisons on insects; ecology deals with life cycles and environment; and morphology is the study of internal and external structure and form of insects. Research and teaching may engage any of the above fields.

There is also the prospect of regulatory service which restricts movement of insects into new areas and control of those which carry harmful plant and animal diseases. It also involves inspection of all forms of transportation entering the United States from foreign lands. State inspectors work in a similar capacity. The field of extension aids the public by making the knowledge and experience generally available. Commercial companies hire many entomology graduates as salesmen, pest control technicians, technical field representatives as well as research workers. Many enter service in foreign countries as representatives of commercial companies and various agencies of the United States.

The person who makes entomology his choice of a career should have specialized study in this field. Background training should be rather broad with some of the more important subjects being zoology, botany, chemistry, plant physiology and pathology. Courses in entomology are offered at all land-grant colleges and universities. South Carolina is fortunate in having one of the better entomology departments in the South at Clemson.

Dr. Fox instructs pest control operations.

BLOCK AND BRIDLE

Bill Johnston and Bob Karney

The Block and Bridle Club is a national organization composed primarily of students majoring in animal husbandry, or persons interested in the development of livestock.

For many years the Clemson Block and Bridle Club has sponsored the livestock and meats judging teams, which have represented Clemson throughout the United States.

Each year the Block and Bridle Club selects an outstanding club member for the previous year to represent the club in the National Merit Trophy Award Selection. Also, fifty dollar scholarships are given every semester to a junior club member whose scholastic standing is high.

Clemson football games would not be complete without the Block and Bridle barbecue. The profits from these barbecues finance all club activities, such as judging trips.

The Block and Bridle Club also sponsors the Clemson Little International, which is a contest of livestock showmanship. This contest is followed by a banquet where awards are presented.

Periodically, the club is honored with guest speakers from all parts of the South.

We attribute much of our success to the supervision and advice of our club advisors, Professor Dale L. Handlin and Dr. Don H. Kropf.

FORESTRY

(continued from page 6)

We are all vested with a duty to protect, nurture and harvest this vast, natural, and renewable resource.

GOODALE

(continued from page 9)

15. There will be contract raising of locally produced heifer calves, and contract handling of dry cows. Specialists with assorted types of equipment will contract to raise, harvest, and store hay, silage and grain for the dairy farmer.

16. In ten years the majority of complete cow records of all kinds will be processed on electronic computers. Cost accounting systems for dairy farms, also using electronic brains, will give us records in the years ahead with speed and accuracy not considered possible a short time ago.

17. A far too small new crop of potential dairy scientists will be struggling to earn the terminal degree in preparation for research and/or teaching. The new era requires leaders with graduate degrees. Extension directors' demand for men with advanced degrees will further deplete the supply. More scholarships, fellowships and assistantships will be available to stimulate interest in graduate studies.

18. The years ahead look promising for the dairy industry despite expected problems. Challenges and opportunities for productive work at the highest possible levels will be plentiful during the coming decade. Dairymen must meet the challenges of the inevitable changing times coming in the remaining sixties. Those who do not may be ex-dairymen by 1970.

DAIRYING AT CLEMSON

Wayne Boone
Dairy, '61

Until 1917 there was no separate department for Dairying at Clemson College. Professor W. W. Fitzpatrick, a graduate of the University of Kentucky, came to South Carolina in 1914 as a Livestock Demonstration Specialist with the Extension Service and was made Head of the Dairy Division when the Animal Husbandry and Dairy Division were divided.

The original Dairy Division was housed in the Old Dairy Building which was built in 1912 and still stands today. At this time the Animal Husbandry and Dairy Divisions were both located in this building.

In 1920, J. P. LaMaster, also a graduate of the University of Kentucky came to Clemson to work in dairy extension. Prior to this time he had been in the Federal Extension Service in the South. On October 1, 1920 he succeeded Professor Fitzpatrick as Head of the Dairy Division.

Professor Fitzpatrick resigned to be the first man in the United States to promote the brand new Golden Guernsey National Milk Program, while continuing to reside at Clemson. Later he became manager of the famous Quail Roost Guernsey Farm near Rougemont, North Carolina where he lives to this day, now fully retired.

A few years after Professor LaMaster was made Head of the Dairy Division, the name was changed to "Dairy Department". LaMaster headed the Dairy Department for 37 years until his retirement on June 30, 1957. He supervised the extensive growth of the Dairy Department and its services to the state, and perhaps more than anyone man, is responsible for the growth of the dairy industry in South Carolina. When Professor LaMaster became head of the Dairy Division, the college herd consisted of three registered Holsteins, thirty two registered Jerseys and twenty five grade Holsteins. He developed a high producing herd to a total of over 600 head. The Clemson dairy herd became one of the largest state college herds in the United States. The college herd from the beginning has served a threefold purpose:

Production of milk for Clemson students and the Clemson community;

Provision for a large number of dairy science research projects;

And the production of animals for student classes.

In 1955, the Dairy Department moved from the old Dairy Building in the center of the campus to the new R. F. Poole Agricultural Center. The new facilities are excellent for both teaching and research; new equipment is being added each year.

Professor Ben E. Goodale became the third head of the Clemson Dairy Department on July 1, 1957. He had been associated with Professor LaMaster since September 1, 1922.

There are three general objectives of the Clemson Dairy Department:

1. To develop a realistic total program designed to help solve problems of our changing times in agriculture in general and in the dairy industry particularly.
2. To further encourage and participate in mutually beneficial inter-departmental and special service activities, and to broaden and enhance the contributions of the Dairy Department.
3. Dairy Department objectives are to be fluid, free to be changed when necessary to better meet the demands of new problems arising from newer techniques in the many phases of dairy science.

MORE TO RAIN THAN WATER

Sitton Allison
Agron., '62

When applying fertilizer to his crops, the average farmer primarily concerns himself with supplying the three major elements - nitrogen, phosphorus, and potassium, which are guaranteed on the bag. Little does he realize that the other elements, even though they are required in relatively small amounts per acre as compared to the larger quantity of nitrogen, potassium, and phosphorus, are definitely an essential requirement for maximum plant growth and quality of the crops he is growing on his soil.

Another element which is very essential is sulfur. Generally, sulfur is either assumed to be sufficient or is actually not given much thought by the average farmer. In the low analysis fertilizers commonly being used, small quantities of elemental sulfur is present. When higher analysis fertilizers are used no sulfur is present. Therefore, it is imperative that sulfur be applied in addition to regular applications of a mixed fertilizer.

Sulfur appears to influence several plant processes. It seems to be associated with the formation of chlorophyll, as shown by the yellow color of sulfur-deficient plants. There is also a relationship between sulfur and the amino acids. The amino acids are important in animal nutrition and may improve the quality of protein in flour for bread making.

Crops such as alfalfa, clover, and cotton require from 15 to 25 pounds of sulfur per acre for normal production. Soils of South Carolina generally contain six pounds or less of available per acre. Some sulfur is added by rainfall. The principal source of sulfur in rainwater, especially in the winter, is probably gases released in the burning of wood and coal.

The concentrations of sulfur in the atmosphere varies from one locality to another. The quantity of sulfur brought down by rainwater in different sections of South Carolina are shown in Table 1.

Table 1. Sulfur collected from South Carolina rainwater.

Collection locations in S. C.	Elemental Sulfur Average annual collection lbs./acre
Blackville	10.0
Clemson	8.0
Columbia	3.8
Summerville	5.1

These values average over a three-year period from four to ten pounds of sulfur per acre annually. This is not enough sulfur to supply the needs of most crops. These results emphasize the importance of soil-management practices which include additions of sulfur. A planned program of sulfur application should replace dependence on incidental additions.

-REFERENCES-

1. Soil, The 1957 Yearbook of Ag.; USDA, pp. 107-111.

2. Sulfur Content of Rainwater and Atmosphere in Southern States as Related to Crop Needs. USDA. Technical Bulletin No. 1196.

SMALL FRUITS

(continued from page 4)

As to blueberries, both the highbush and rabbiteye types can be grown in South Carolina. While the rabbiteye is better adapted, the highbush is the better commercial producer. Growing of the highbush varieties has not yet become fully established in the State. The rabbiteye bears well in all parts of the State. Callaway, Tifblue and Homebell are excellent rabbiteye varieties, with Rancocas, Rubel and Jersey being satisfactory highbush varieties.

One of the most important factors in blueberry growing is the pH of the soil. A pH range of 4.0 to 5.5 is considered the best. The use of complete acid-type fertilizers is recommended. Relatively little work is required in growing blueberries. Only occasional pruning of dead wood is necessary and pest and disease problems are at a minimum. A sawdust mulch around the plants is beneficial in that it helps with the moisture problem and retards weed growth. It is always best to plant several varieties together since cultivated blueberries are partly self-sterile.

As an ornamental the blueberry is very attractive and easy to keep in bounds. The foliage and fruit are complementary and after harvest the leaves remain green until fall.

Bramble fruit culture is probably the least important small fruit crop in South Carolina. Their thorny characteristic is one limiting factor, and many varieties are not adapted to this climate. However, many new thornless selections look promising, with a thornless boysenberry now available for commercial or home planting. Thornless blackberries are to be released in the near future. If you care to tangle with the "thorny tiger" your efforts will be well rewarded. Two excellent blackberries available are Hedrick and Ebony King.

EDITORIAL

(continued from page 3)

But, does the young man entering college leave behind his need for motivation through the personal interest of his teacher? Does the influence - truly the obligation - of the college teacher end with the dispensation of technical material? Trite questions? Perhaps so, but we submit that some refreshing opinions concerning such questions might be heard from the student side of the classroom rostrum.

What do students know about teaching? It is the opinion of the writer that students are the only persons in a position to appraise the current status of teaching at the classroom level. Administrators of schools or departments do not hear their professors perform. To do so would be "an infringement of academic freedom", it is said.

At the close of his undergraduate career, the college student has very lately been exposed to some forty different teaching environments. His professional performance will be determined in large measure by the composite of these influences. If the student were encouraged to criticize this experience by way of essay or forum, measurable contributions might be made toward more effective classroom communications.

* * * * * * * * * * * * * *

These can be trained to individual stakes or put on a wire trellis making for easy care. (Leather gloves are a handy item to have around).

Upon deciding to plant any of the small fruits keep these points in mind: (1) Always buy from a reputable nursery to obtain top quality, disease-free plants. (2) Use recommended cultural practices for each fruit.

For happy eating and increased profits: GROW SMALL FRUITS!

AULL ON AGRICULTURE

G. H. Aull

It would be difficult for me to recall when, if ever, I have undertaken an assignment with more enthusiasm than that with which I began the preparation of this paper. I believe in the subject assigned to me, which basically is Agriculture; I am proud of its past; I am challenged by its present situation and its problems; and I have high hopes and rich expectations as to its future.

I believe firmly that man's first responsibility is to serve his fellowman. If this becomes his fixed goal, his exact vocation assumes a place of secondary importance but under no circumstance can it ever be dishonorable or degrading. If you are with me thus far you will agree, I am sure, that in a broad sense a man's vocation is bigger than his job and his goal is far out beyond the particular thing which occupies his working hours.

As an economist, interested in the future welfare of our state and nation and striving earnestly to contribute to a balanced economy in our area, I am alarmed at the ignorance and the prejudice of many leading citizens as regards so basic an industry as agriculture. They not only subscribe to the mistaken notion that anyone who chooses a career in agriculture must somehow be inferior to one entering upon one of the other broad areas of specialization, but they actually believe that certain kinds of agriculture are lower on the scale of values than certain other kinds. The Bible speaks of the fact that the human body "is not one member but many" and says that when one member suffers all suffer and when one member is honored all are honored. This is equally true of the "body politic" and the sooner we recognize it the better.

(Continued page 18)

Ed. Note-

A series of Agricultural Career Planning Conferences was recently held throughout South Carolina. The meetings were jointly sponsored by Clemson College and the South Carolina Department of Education for the primary benefit of high school counselors.

Keynote speaker for the conferences was Dr. G. H. Aull, Head, Department of Agricultural Economics and Rural Sociology, Clemson College.

THE AGRARIAN is honored to present selected portions of Dr. Aull's timely remarks.

AGRICULTURE

(continued from page 17)

No great civilization was ever built solely on an agricultural foundation. To the contrary, a self-sufficing agriculture leaves no opportunity for producing anything above the basic necessities and it was only after agriculture developed a considerable measure of efficiency and productivity that man-power was released to produce something more than food and clothing and shelter.

However, so slow was our progress in agriculture that up until about 100 years ago a farmer from the generation of Moses would not have felt terribly out of place had he suddenly been transplanted into our own rural society. As a matter of fact, changes in U. S. agriculture within the last 50 years have probably surpassed in significance anything which took place during the previous 5000.

Let me add in passing that much of the credit for this magnificent accomplishment must go to the U. S. System of Land Grant Colleges which will shortly round out 100 years of service to the American economy. It was the Land Grant College System which provided most of the personnel and much of the information necessary to service our far-flung agricultural endeavors which have redounded not merely to the benefit of farmers but more particularly to the benefit of consumers throughout the world. Supported by this system we have, within a remarkably short time, grown from a nation in which one out of every four workers was required to produce the basic agricultural necessities to a nation in which one farmer is supplying the food and fiber for 24 people! To get the products of this one producer to the 23 other consumers, we have created in this country a system of distribution which is a challenge to the best minds of any generation. I would warn you, however, that this system would crumble in a week were it not supported by a series of agricultural organizations and enterprises unequalled in all the world.

We hear a lot these days about the Russians overtaking us in the race to conquer space. This, of course, is a problem which involves not only politics, but engineering, physics, mathematics, chemistry and a host of other sciences. Unfortunately in recent years it has been the practice among some representatives of these sciences to point a finger of scorn at anyone who showed the slightest interest in agriculture and to imply that somehow their specialty has a monopoly in brains and in its appeal to the youth of this country. To such as these I say: "Look at the record."

Have they not heard that Russian agriculture today is at the point where we were 120 years ago?

Do they not know that productivity in American agriculture over the past 10 years has grown at a rate more than twice as fast as that in nonagricultural industries?

Are they not aware of the fact that one hour of farm labor today produces 4 times as much food, fiber, and forest products as it did 40 years ago, and that as a result we in this country not only eat better and live more comfortably but spend a smaller percentage of our income for food, clothing and shelter than the people of any other country on the globe?

In passing let me say that I have been more than a little disturbed by the criticisms which have been heaped upon agriculture in recent years and especially so since the basis for it

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AGRICULTURE

(continued from page 18)

is that we have produced not too little but too much! One might suppose that a record such as that established by our agricultural plant would merit the highest praise of all the people. Instead we have seen farmers misrepresented and vilified as no other group in recent economic history. They are accused of piling up enormous profits at public expense. They are blamed for government deficits and for the high cost of living. Flogging the farmer has become a popular national pastime.

This is not the time nor the place for a defense of our agricultural economy (I have done this on other occasions) but I would like to present to you a few facts just to keep the record straight. For example, did you know that:

a) The farmer's share of the price you pay for a loaf of 23 cent bread is only about 3 cents? (Twelve years ago when bread was 9 cents a loaf cheaper the farmer received a little more than 3 cents).

b) Actually the farmer receives a little less for growing the wheat in a loaf of bread than the retailer does for handling it.

c) It costs more to launder a cotton shirt one time than the farmer gets for all the cotton in it.

d) The cellophane bag in which you buy your carrots costs as much as the farmer gets for growing the carrots.

e) You pay your grocer as much for the can containing tomatoes as the farmer gets for what is in the can.

f) Within the last 10 years for every $1.00 increase in the cost of food the farmer's share has been about 10 cents.

Again, I am sure that many of you have been told that agriculture is the chief beneficiary of federal subsidies. This, too, is far from the truth. For instance, one of the chief critics of U. S. farm policy is a large magazine which is itself beneficiary of a mail subsidy amounting to nearly $9 million a year. Similarly, manufacturers complain because the American farmer gets a little more than the world price for his cotton, but they seem to think it perfectly all right for the government to impose a 40 percent import tax on something they make. Laborers who resent government purchases of milk and pork feel no hesitancy in entering into an unholy alliance with this same government to establish a floor under their hourly pay. Shippers using government built vessels and plying their trade over routes paid for by public funds are not overly sympathetic toward "subsidized farm credit" and government sponsored telephone and electric services for farm people. Numerous nonagricultural commodities are being bought by our government and "stockpiled" far beyond the limits imposed by national security.

Let us turn now to the future. Currently we are adding to the population of this country alone at the rate of nearly 3 million souls a year. That is more than the present population of South Carolina and it means that by 1975 we shall have in the United States a total of about 230 million people, an increase of nearly 50 million, or the equivalent of 20 South Carolinas! (Continued page 20)

AGRICULTURE

(continued from page 19)

Worldwide we accomplish this feat (of 50 million more people) every year. This means a new Columbia every day; a new South Carolina every three weeks; and a new United States every four years! So powerful is the population explosion which you and I are witnessing that the number of people living on this earth in 1975 will probably exceed one-fifth the total number born since Adam and Eve set up housekeeping in the Garden of Eden.

If I am correct in these assumptions, there is going to be a lot of new activity going on in the fields of producing, processing, transporting, selling, financing and otherwise servicing the needs (and the desires) of these people for the products of agriculture. For the United States as a whole, the best judgement at this time seems to be that by 1975 we shall need something like:

55 percent more beef and veal
40 percent more milk and pork
35 percent more eggs
30 percent more cotton
20 percent more broilers

plus substantial increases in all of the fruits and vegetables and in forest products.

Now, I do not mean to suggest that we will need corresponding increases in the numbers of workers required to produce, distribute and service the vast enterprises associated with these operations. What I am saying is that - and let me make this very clear - the agriculture of the future will of necessity have to be organized, planned, directed and actually operated by men and women with special training. The alternative would be intolerable increases in the cost of food and clothing, frequent scarcity of basic necessities, and the ever-present threat of actual starvation in various sections of the country.

It is estimated by competent authority that the number of farms in the United States will continue to decline from the present 3.7 million to perhaps 2.0 million by 1975. However, to service the needs of these 2 million top flight producing units and to process their ever-expanding production and distribute it to the far corners of the earth will require an increasing number of college trained men and women with technical knowledge of the peculiar requirements of agricultural production, financing, and marketing. It is this sort of training we are endeavoring to provide at Clemson with our science, business and production "options" in the several subject matter areas. We are determined not only to make agriculture better through science and technology but to service it better by increasing the numbers of those qualified to make it function.

If these goals sound fantastic, let us recall that most of the progress of mankind thus far has taken place within a relatively few years. To dramatize this fact, let us compress the 500,000 or so years man has lived on this earth into a period of 50 years:

It took 49 of these 50 years for man to settle down and learn to wear pants.

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Six months ago he learned to write.

Two weeks ago he built the first printing press.

Four days ago he began to use electricity.

Yesterday he learned to fly, developed radio, television, diesel power, rayon, nylon, motion pictures, and high octane gasoline.

Since breakfast today he released atomic energy, built jet planes, conquered polio, and launched a score of satellites.

Within the last few seconds he has looked at the dark side of the moon and sent a rocket around the sun.

It is against this background that we look to the future. We have every confidence that agriculture will meet the challenge. However, change does not come easily and without pain. Nor, for that matter, does character. If we are to be a great nation and a good people we shall have to work at it. Even then the road will not be smooth but the reward will be satisfying.

When God made the oyster He guaranteed him absolute economic and social security. He built the oyster a house, a shell to protect him from his enemies. When hungry the oyster simply opens his shell and the food rushes in for him.

But when God made the eagle He said "the blue sky is the limit; go and build your house." And the eagle built on the highest mountain crag, where storms threaten him every day. For food, he flies through miles of snow and rain and wind.

The eagle, not the oyster, is the emblem of America.

TALL CORN

Night Watchman: "Young man, are you going to kiss that girl?"

Freshman: "No, Sir."

Night Watchman: "Then hold my lantern."

* * * * * * * * * * * * *

Farmer Brown had a mule (Son) that he couldn't teach or tame, so he took the animal to a professional mule trainer (Professor).

The trainer (Professor) immediately grabbed a stout stick (Red Pencil) and beat the mule (Student) unmercifully about the head and along the flanks.

"Stop!" cried Farmer Brown. "Are you trying to kill my mule (Son)?"

"No," he replied, "I've got to be sure that I've got his attention."

* * * * * * * * * * * * *

A Quaker had a very mean cow. The cow was always putting her tail in the milk bucket, kicking the poor fellow, and refusing to stand still.

Finally, after a particularly trying morning, the Quaker told the cow, "Friend cow, I would not beat thee or harm thee for the world, for it is against my religion. I will not punish you in any way, but I'll sell you to my brother-in-law who is a Baptist, and he'll beat hell out of you."

* * * * * * * * * * * * *

Frosh: "I just brought home a skunk."

Roomie: "Where ya gonna keep him?"

Frosh: "I'm gonna tie him under the bed."

Roomie: "What about the smell?"

Frosh: "He'll just have to get used to it like I did."

AN AGRARIAN DAY

Jere A. Brittain
Hort., '61

Every man with even a trace of dirt in his shoes will attest that a timely sojourn in the wilderness can refresh the soul beyond measure. The term "wilderness" as applied here is not intended to connote some distant and primieval forest. To the contrary, one man's wilderness may be no farther than the upper corner of his farm pond. Mine happens to be the white water of the Blue Ridge!

On a recent Friday afternoon, Claude Derting, Don Fox and I were dissolving in coffee our appraisals of the academic week. There eventually precipitated this opinion, as paraphrased from Wordsworth:

"Books! 'tis a dull and endless strife;
Come, hear the East Fork linnet,
How swift his water on my boots,
There's even Brook Trout in it!"

We breakfasted the following morning over a crackling bed of hickory coals on the bank of the East Fork, Chatooga River, where North Carolina tumbles into South.

The sun had just began to tease the top of the gorge when we tied on a #10 Eagle-Claw, dangled a garden-hackle just-so, and stepped into the spring-flushed stream.

For the next eight hours we were in a world apart. The loud quietness of the hurried mountain stream was a solace. A man balanced on a lichen-covered log below a swirling rapids, his fly-rod bent to the unexpected surge of a chunky Brown, is in profound communion with his environment. This is indeed an AGRARIAN experience.

At mid-day we paused to kindle a fire, cut some birch forks, and roast and eat some of our catch. Fresh mountain trout with black "biled" coffee ....an AGRARIAN repast!

We swung down the rocky face of Hell-Hole Falls by grass rope, anchored to the roots of a rhododendron which apparently clings there out of sheer persistence. This is an East Fork tradition -- a sort of landmark in the winter conversation of those who've been that way.

When twilight overtook us we climbed out to the old logging trail, which parallels the river high on the less precipitous side. On the leisurely trudge up the river we paused here to admire a yellow poplar cove; tarried again to drink at a branch typical of the multitude which are the icy tributaries of the river.

Darkness ...... the journey homeward .... very little conversation ... each man reflecting a day well spent .... an AGRARIAN day.

This issue of THE AGRARIAN is sponsored by:

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COVER

This design appears on the entrance to The Plant and Animal Science Building. It was executed by Willard Hirsch, the Charleston sculptor, and can be interpreted as follows: The bull's head stands for animals, the leaves stand for plants, and the retort represents the sciences. The retort stands out in both the design and in agriculture. Science is becoming more and more an integral part of agriculture.

CLEMSON SWF SWINE HERD

by
Bill Johnston

Over the past few years there has been a tremendous increase in the number of swine disease cases reported. Such diseases as infectious atropic rhinitis (AR), virus pig pneumonia (VPP) and swine dysentery, have caused a great economic problem with producers.

In 1956 at the University of Nebraska, the production of specific-pathogen free pigs (SPF) was started. In their program of production, the pigs were removed from the sow shortly before birth (112th day of gestation) and raised under highly aseptic conditions until one month old. This process breaks the transmission chain of AR, VPP, and other virus diseases (from sow to off-spring). Their program was very successful and is still in full swing.

Under the supervision of D. L. Handlin, Assistant Animal Husbandman, Clemson College has started its SPF program. On May 2, 1961 Dr. J. B. Thomas, Supervisor of Swine Disease Control at Clemson College Poultry-Livestock Department located at Columbia, South Carolina, removed the first litter surgically. The freshly removed pigs were placed in incubators for the first week of their lives. The incubator is in a clean, white room, ventilated by filtered air kept at 95 degrees temperature. During the first week they are fed a sterile liquid diet. This diet consists of milk, minerals and vitamins. The week old "pigglets" were then placed into brooders, where they remained for three weeks. In this period they were changed from the liquid diet to a regular pre-starter diet.

On June 1, 1961 this first litter of SPF pigs arrived at the new Clemson Swine Research Center. Since that time eight more litters have been taken by the hysterectomy method. Presently the farm's population is fifty-seven.

CLEMSON COLLEGE
SWINE CENTER
DEPARTMENT OF ANIMAL HUSBANDRY
·TEACHING·RESEARCH·
·EXTENSION·
POPULATED WITH SPECIFIC PATHOGEN FREE PIGS
AREA

The SPF pig is not free from all diseases. Inoculations must sill be given for cholera, erysipelas, and other swine diseases. However, the SPF program is well worth the money and time involved in it. The four main goals of the SPF program at Clemson are:

1. Eliminate AR, VPP and possibly other diseases from the Clemson College breeding herd.

2. To replace in its entirety the existing breeding stock with a breeding herd originating from stock tracing directly to animals taken by hysterectomy (surgical removal of pigs from dams on the 112th day of gestation).

3. To determine whether a herd of swine developed in this manner could be maintained free of AR and VPP.

4. To follow an ideal health and sanitation program.

RURAL ZONING —THE FARMERS FRIEND

James H. Markley

Let us begin by asking a question. Do our communities have sufficient room for both urban expansion and agriculture? If the answer is negative, it's high time something is done about it. The non-agricultural needs for land and water resources are increasing very rapidly. Fertile soils are irreplaceable in our communities. Once they are converted to non-farm use, they are lost forever to agriculture.

The economic impact of this loss is quite alarming. The price of land goes up with taxes. Assessments are voted by non-farm members who have other sources of income. A high proportion of the total cost is shifted to agricultural land which cannot support it. The farmer gets hit twice; once by losing his valuable fertile soil and the other by paying more tax. This economic erosion is just as severe and wasteful as soil erosion.

Another factor is the instability of land use on the urban fringe. City dwellers, with surplus capital, often invest in farm properties. They do so with the idea of high return on their investment, resulting from swift urban growth. These various kinds of speculation promote urban expansion and further land deterioration.

Zoning is an effective method of obtaining public control over land development. It is the only feasible way of controlling the conditions discussed above. Zoning does not unfairly deprive property owners of their rights. The benefits derived from zoning laws can be local, direct and personal as well as indirect and intangible. They create and maintain healthy and attractive areas. Zoning necessarily results in limitations to both parties, the urbanite and the farmer. However, if they will strive to encourage or limit the use of land in the best interests of both the individual and the community.

A zoning ordinance for rural or semi-rural areas should not interfere with farming operations, but should be designed to regulate the land uses in such a manner as to protect property values. If the people of the community use zoning as an instrument for constructive guidance for the use of land, it will work well in their behalf. Community goals must be established and comprehensive planning programs followed. It is essential that these practices be followed to insure the community that it will grow according to a logical plan.

The adoption of zoning laws are dependent upon public initiative and action. A zoning ordinance should be locally initiated and to a large extent locally supported. In order for zoning to contribute the fullest measure of direction to the future growth of the community, it must be understood and wanted by the people. This is the secret. Let us plan for the future so all may benefit. Let us push zoning laws where they are fair and equitable for all. When we accomplish this, zoning will work for the farmer and become his lifelong friend.

UNCLE SAM'S GARDEN

by

Jere A. Brittain

Recently the venerable political scientist, one Uncle Sam, became tired and frustrated with the seemingly insoluble problems of his democracy. So---leaving his rocking chair of state in "vigorous" hands, Sam set out to study and reorient himself at one of the cornerstones of this unique form of government.

Now Uncle Sam was reared on a farm, as he was proud to relate. So why not go back to the old homeplace down in South Carolina and do some farming? As he recalled, the farmer was a capitalist in the best sense; he owned the land; he controlled the inputs; he sold the outputs wherever he could, at the best price. Real American entrepreneurship!

Our farmer arrived at the old plantation in midwinter. A nephew, twice removed, had been keeping the place for Sam. The pair quickly dispenses with a TV dinner (Sam hadn't remembered the Agrarian repast as anything of this sort) and set out to tour the premises.

"Nice cover crops you've got here Orvil," admired the elder.

The younger looked askance."Them ain't cover crops Unc! Them's permanent sods."

"Permanent hell! I don't see any stock grazing on 'em," roared the capitalist.

"But Unc," squirmed Orvil, "We've rented the land to the government. It's called the 'soil bank' !"

"What's the government going to do with it?"

"Nothing. They're just paying us to not grow any crop -- conserve the soil and all. Course we don't make quite as much as if we cropped it, but that government check makes me feel mighty secure."

"Humbug!" judge Sam. "Any farmer worthy of the name can conserve the soil and crop it too, if it's fit. You'll get up off your security and prepare some land for cotton and tobacco if you have to rent it! I intend to give my capital a chance to work for me."

"You're forgetting something Uncle Sam," replied the nephew. "We can't grow cotton or tobacco without an allotment from ASC. They tell us how much we can plant in exchange for guaranteed prices."

ATTN FARMERS:
TRADE YOUR HOE AND FREEDOM FOR SECURITY
SEE U.S. GOVT.

Sam's reply is not quoted in the interest of preserving his dignity. From the impromptu oration on the great truths of free enterprise, Orvil finally discerned a query as to who had emplemented this program.

"Well sir, in a way, we farmers asked for it as a sort of protection. We were assured it would be in our best interest - it sounded sort of patriotic besides. Why they say it will eliminate small, marginal producers and make agriculture more efficient!"

The great furrows of the old gentleman's brow deepened as he pondered that observation. Eliminate marginal producers indeed! If they were truly marginal, why weren't they eliminated by economic forces? This line of reasoning would logically end at total centralized control of the farming enterprise. Was the federal government, already controlling utilities and making inroads on schools and housing, to become the potentate of food and fiber also? Would "the pursuit of happiness" become the pursuit of bureaucratic benevolence? In the ebb of day, the field before him was darkening, as it were, by the shadows of those great bearded figures of American history who had boldly conceived this experiment in limited central government - many of them products of "marginal farms."

Turning to livestock as a possible enterprise, Sam was confronted with the problem of feeding cattle or hogs on price supported grain. Dairying was a rather closed fraternity of local monopoly. And broilers it seemed were faced with a marketing order.

Noting that his neighbors still grew gardens and fruit trees, Sam inquired about prospects for horticultural controls.

"These fruit and vegetable growers are a right peculiar bunch,"informed Orvil. "They seem willing to take all sorts of chances for a big profit occasionally. When we get home, I'll show you some literature they've published."

That evening, Uncle Sam was browsing through a booklet entitled Resolutions of the Vegetable Growers Association of America.

In tones of a man who had found what he'd lost, Sam hollered, "Orvil! Where's a seed catalog?"

Having complied, the young keeper of the farm picked up the booklet which still lay open to a passage circled in red.

"We are opposed to Federal subsidies to any segment of the national economy, including government price support programs for agriculture. Such handouts add to the staggering burden of the taxpayer, encourage inefficiency, increase costs to the consumer, make necessary a non-productive Federal bureaucracy to spin out endless regulations and controls and eventually stifle individual freedom and responsibility.

We urge all Americans to steadfastly oppose the creeping socialism implicit in any subsidy program, and the steadily increasing subordination of the individual to the state.

We specifically point to the glaring failure of the Federal agriculture programs, costing an estimated $5,000,000,000 annually, to do anything but poison the wellsprings of agricultural free enterprise."

DAIRYMEN AS AD-MEN

by

Jerry L. Moore

Have you ever considered the importance of research and advertising in producing sales for food products? As more food products are displayed on the store shelves, consumers are being forced to make more and more decisions about their food purchases, because this consumption cannot be substantially increased. As a matter of fact, food consumption has decreased from 1668 pounds of food per person in 1945 to the current 1500 pounds per person. It becomes evident that any food product must be in a good competitive position to make per-capita gains. People are not going to continue to buy simply because they bought in the past. With these ideas in mind, dairy farmers organized the American Dairy Association in 1940 with a goal of giving the dairy industry an effective voice in the American market place.

The specific purpose of the American Dairy Association is to strengthen the markets for dairy products with a year-round, nationwide program on a non-brand, non-profit, non-legislative basis. The dairy farmers themselves support this advertising program built around research, public relations, and merchandising. Two cents from every one hundred pounds of milk sold by the farmer supports the current six and one-quarter million dollar budget of the A. D. A.

Is this money well spent, or does it serve only to raise consumer prices and to profit the dairy processors and advertisers? First, let us emphasize the fact that the A. D. A. advertising and research program is financed solely from the farmers' milk income, not by the processors. Therefore, the program backing A. D. A. advertising and the advertising itself are free gifts from the farmer to the consumer.

Now, what about some of the effects this research and advertising program has produced? First, the research stimulated by stiff competition has produced improved products as well as many new ones. Improvements in processing, preservation, and packaging of milk and its products are quite evident. The improvements made in non-fat dry milk - better taste and wider use in many foods - serves as a good example. Second, more variety in the American diet has been the result of the A. D. A. test kitchen. Four trained home economists develop more than five hundred dairy recipes and menu suggestions annually. Variety, while being the spice of life, is also the delight of every meal. This delight has been produced by the ADA test kitchen staff. Research sponsored by the dairy farmer has served its purpose well by providing new and improved products served in a variety of new ways.

The real effect of the research program cannot be felt, however, until its results have been promoted through advertising. The distribution of new recipes and new combinations originated by the research staff accounts for the first advertising advantage. Homemakers and the public in general are educated to new, varied, and improved products as well as to more healthful and nutritious diets. The use of sour cream offers a good example. Because many people have not tried this palate-pleasing product, dairymen will introduce it to the public in 1962 with a concentrated advertising program.Cottage cheese is a very similar example.

Education of teens and youngsters to dairy health foods will be a big objective of the 1962 advertising campaign and a big advantage to the younger set - compliments of the A.D.A. advertising.

A third advantage of dairy advertising is the entertainment it supports. Bob Hope, Bob Crosby, Perry Como and Dave Garroway are a few famous names who have been sponsored by the A.D.A. in the past. Watch Dinah Shore in 1962 - with the best wishes of the dairy industry!

AG TEACHERS—FARM MANAGEMENT

by

Wayne Rish

Could it be in future years that the farmer's most important implement could be a pencil? Although that may sound strange, Agricultural Economists, in general, agree that many farmers are losing money because they do not utilize the pencil and the principles of farm management in their farm operations. Management problems on the farm today are greater than ever. Farms are getting larger, margins of profit are very small, investments needed for operation are increasing, and mechanization is rapidly replacing labor.

Some of the management problems facing the farmers are: selecting enterprises and sizes of each, reducing cost of production, wise use of labor, buying machinery and financing.

Last summer the Division of Vocational Agriculture, State Department of Education, and the Agricultural Education Department at Clemson initiated a program to promote and encourage the teaching of more farm management through the Vocational Agricultural Education Departments in the High Schools of South Carolina. The first phase of the program was an intensive two-week course in farm management for thirteen key Agriculture Teachers from the six supervisory districts in the state. This workshop was directed by Professor L. M. Bauknight, Agricultural Economics Department, with assistance from staff members of the Agricultural Education Department.

This two-week course included a review of farm management principles, an analysis of a farm in the local community of each teacher, making a farm management study and analysis of two farms near Clemson, and collecting teaching information.

Following the training period at Clemson College, two-day workshops were held throughout the state for small groups of Agriculture teachers. In each district, Mr. Bauknight was assisted by the two key teachers who had attended the training program at Clemson. During these workshops, a farm in the community was visited and studied, the principles of farm management were reviewed, and plans were made for the teaching for farm management in the local community.

During the State Teachers' Conference at Clemson in August, the need for teaching farm management was emphasized. Discussions were led by L. M. Bauknight, F. E. Kirkley of the Agricultural Education Department, and Frank Barton of the Farm Credit Administration.

Efforts to encourage and assist teachers in presenting this subject of this instructional group will be made throughout the school year. Teaching materials are being prepared and additional conferences and workshops will be held when needed.

THE BIOLOGY CURRICULUM

by

John Schachte

Beginning with the fall semester of 1961-62 a new curriculum was established at Clemson. The following events led to the creation of this curriculum.

In 1913 the first major in Botany was established at Clemson. At that time students could major in one of seven divisions and minor in a second. Botany and Entomology were included in these seven divisions. This curriculum continued until 1921 when majors in departmental areas, as now practiced, were established. By 1920, however, the seven divisions had been increased to ten. Among the eleven Botany graduated between 1913 and 1920 was the former president of Clemson, the late Dr. Robert Franklin Poole. The botany program was under the supervision of Dr. H. W. Barre, now retired and residing at Clemson.

In 1921, with the establishment of departmental majors, the Botany major was eliminated and the Entomology major was continued.

Again in 1947 a Botany curriculum was established in the School of Agriculture. In the same year an area of concentration in the Biological Sciences was added for students in the School of Arts and Sciences. This Botany curriculum was offered for ten years, until 1957 when it was again dropped since only one Botany major had graduated during that period.

In 1961 the Biology major was changed from an area of concentration in Arts and Sciences to a curriculum in the School of Agriculture. It is administered jointly by the Departments of Botany and Bacteriology, and Entomology and Zoology.

The Biology curriculum is arranged so as to give the student initially a broad background in the biological, physical, and social sciences, and to permit him to select an option in Botany or Zoology in the Junior or Senior year.

The Biology graduate can expect to choose from a wide variety of job opportunities. Most important of all, is the fact that there are shortages in the present supply of biological scientists. Today there is not a single branch of Biology that doesn't have space for qualified new applicants. Biology graduates can find employment with federal, state and local governments. Several years ago, a survey of so-called "white collar" workers in the federal government's executive branch showed about 900,000 persons distributed into 450 administrative, professional, and technical occupations. This figure represented about 40 per cent of all civilian federal employees. Of these, some 26,000 were catalogued as biological scientists.

More biologists are primarily engaged in teaching than in any other single activity. Of the estimated 64,000 biologists, some 22,000 are teaching in colleges and universities. Excluded from this total are the approximately 30,000 persons who teach Biology in secondary schools. Those who desire to teach on the college level or to do research are usually required to have graduate training leading to an M. S. or Ph.D. degree.

Jobs are also available to biologists as technicians whether one is interested in working outdoor or in the laboratory.

Private industry also has its place for the biologist. Commercial establishments which produce and market foods, feeds, drugs, seeds, many kinds of chemicals, materials for teaching laboratories, instruments and machines of production and research, are but a few of the businesses requiring the skills of the biological scientist.

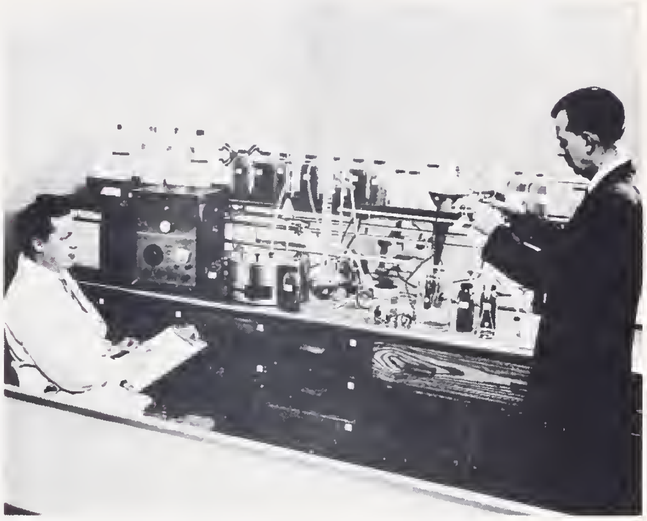
FOOD TECHNOLOGY A FORWARD LOOK

by

Arthur Pfister

The application of science and technology to agriculture has made the United States the most efficient food-producing nation of the world. This foremost position has been achieved through the combined efforts of agricultural scientists, extension workers, and farmers. Yet, in spite of the rapid advances in production, agriculture still faces tremendous challenges, many of which are concerned with marketing and utilization of farm products. Agriculture today must look beyond efficiency in production of raw products. It must provide materials having rigid standards of quality. The amount of processing applied to these products must be increased. The complex physical and chemical structure of these products must be understood. Wholesome and attractive foods must be provided that meet the nutritional requirements of the body. The development of more convenience, food and special foods such as those for space travel are needed. Through more complete understanding and extended practice of these aspects, agriculture will enjoy a greater measure of stability.

A large step forward was taken at Clemson this year with the establishment of a new curriculum in Food Technology. The purpose of this curriculum is to provide a sound training program for this rapidly expanding phase of science.



Food Technology is by definition the application of science and engineering to the production, processing, storage and distribution of foods. Food products are by nature complex, biological substances which vary in composition with differences in variety or breed, soil, climate, processing, and storage. For one to become an authority in this field, it is necessary to have a basic training in chemistry, biochemistry, nutrition, physics, microbiology, and engineering as these apply to agricultural food products. The new Food Technology curriculum has been planned carefully to provide such training. Graduates in FoodTechnology from Clemson are expected to command attractive positions in research, teaching, development, inspection, manufacturing, sales, and management.

As more trained food technologists assume responsible positions, it should be possible to attack more effectively the three most pressing world food problems, namely: (1) the need to produce enough food for the world's exploding population; (2) the need to reduce food spoilage and waste through suitable processing and preservation practices; and (3) the need to provide foods that have the proper nutritional attributes for health and well being.

BETWEEN THE FURROWS

AGRONOMY CLUB

On November 7, 1961, twelve members were initiated into the Clemson College Agronomy Club. This was an increase from last year.

The Soil Judging Team went to the Southeastern Regional Soil Judging Meeting at Cookeville, Tenn., November 3 and 4. This was the first time Clemson had participated in such a meeting. John Meetze placed third in the region. Other members of the team were: Jimmy Palmer, Joseph B. Graham, and Beaty C. Graham.

Juniors and Seniors in the Agronomy Club went to the American Society of Agronomy Convention in St. Louis during the week of November 26.

BLOCK AND BRIDLE CLUB

This fall the Clemson College Livestock Judging Team, coached by Professor Dale L. Handlin and sponsored by the Block and Bridle Club has participated in two intercollegiate judging contests.

On September 25 the team competed in the Mid-South Fair Contest which took place in Memphis, Tenn. After the contest, the team was treated to a rodeo and a banquet. With Craig Keese placing fifth high individual in all classes, the team placed sixth out of the twelve teams that participated.

On October 2, the judging team participated in the judging contest at the Southeastern Fair in Atlanta, Georgia. Clemson placed fourth out of five teams with Craig Keese high individual in the contest. He received a cash prize of fifty dollars.

Members of the team that took the trips were: Craig Keese, George P. Jones, Bill Finley, Roger Crouch, Sidney Kennedy, Marlon Vallentine and Bob Tripp. The meats team placed fourth in their judging contest.

The Block and Bridle Club held its annual fall Bar-B-Que at the Clemson-Wake Forest game. The members of the club were assigned to certain committees which were necessary for the success of the Bar-B-Que. The menu consisted of: Pit cooked Bar-B-Que, Hash, Slaw, Rolls, Rice, and Tea.

DAIRY CLUB

The American Dairy Science Association recently initiated ten freshmen and two sophomores to bring its total membership to the highest level in recent years. These ten freshmen represent the largest entering class since the forties. Among the new initiates was Miss Dixie L. Marion of Lindale, Georgia, the first dairy co-ed in the history of the school. Dixie has chosen the Dairy Production Technology Option as her major.

The dairy cattle judging team returned from Waterloo, Iowa in late September after participating in the regional contest in Memphis, Tenn., and the international contest in Waterloo. Ken Butcher was third high in the Holstein breed in the nation. Other team members were Jim Caughman and Jim Morrison. Mr. C. C. Brannon was the team coach.

The products judging team enjoyed more success than usual in their participation in the regional competition in Morgantown, W. Va. and international competition in Washington, D. C. The team placed fourth in the regional contest and thirteenth in the National Contest. Bob Kapp was second best ice cream judge in the nation. Other team members working under coach Dr. J. J. Janzen were Dick Wilkes, Jerry Moore, and Cedric Thomas.

The Dairy Club constructed an eye catching homecoming display again this year. Pat McMullan was Chairman.

F. F. A.

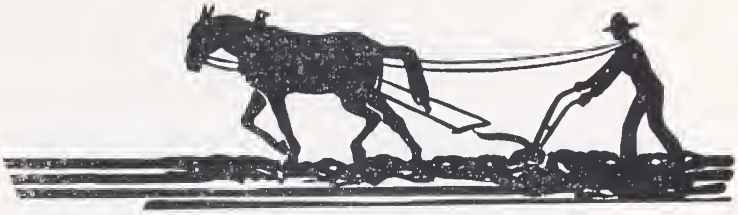
Kicking off the activities of the Clemson Collegiate Chapter of Future Farmers of America for this year was a cook-out at the home of Dr. Lowery H. Davis, Head of the Department of Agricultural Education. In attendance were 74 old members, the staff and families of the Agricultural Education Department, Dr. and Mrs. J. W. Jones, Director of Agricultural Teaching, Mr. W. E. Gore, State Supervisor of Vocational Agriculture in South Carolina, Dr. and Mrs. Earle Carpenter, University of Missouri, and 30 prospective members.

Eleven chapter members and Dr. Davis spent the weekend of October 28 in the mountains of North and South Carolina. Highlights of the trip were a talk by Mr. Ray, Oconee State Park Superintendent on the state park organization in South Carolina and a visit to the Walhalla Fish Hatchery.

FARM ECONOMICS NEWS

This fall has been a most active one for the Clemson Student Chapter of the American Farm Economics Association, headed by Sammy Marsh, a senior from Camden.

The school term got underway with a hamburger supper in honor of the freshman members at the home of Dr. and Mrs. H. L. Spurlock. Dr. Spurlock is the chapter adviser.



The chapter also built a display for Clemson Homecoming Weekend which was featured on the lawn of Long Hall. Jim Markely, a senior from Ridgeway, New Jersey, was the designer and chairman of the Display Committee, but the project involved an enthusiastic effort on the part of all students in the department.

At the first meeting, Dr. G. H. Aull, Head of the Clemson Agricultural Economics Department, talked to the group on the philosophy of the department, its emphasis on building strong character as well as sound scholarship. Luke Hamilton, Clemson Extension Editor, discussed career opportunities in agricultural communications at a later meeting. Other programs throughout the year will emphasize the variety of careers available to the Ag. Economics graduate.

HORTICULTURE CLUB

This past summer, James B. Aitken, a senior, and Robert G. Halfacre, a junior, attended and participated in the 1961 American Institute of Biological Science Meetings held at Purdue University, LaFayette, Indiana. Highlights of the trip included the second National Meeting of the Collegiate Branch, The American Society for Horticultural Science and the presentation of papers at the horticultural sessions. At the branch meeting, Mr. Aitken, Secretary of the Southern Region, was secretary of the National Collegiate Branch. Also, he placed fourth in the presentation of papers.

At present the Hort. Club is engaged in making jelly and jam to provide financial aid to enable the club members to attend the Southern Region Convention in Jacksonville, Florida, in February.

POULTRY SCIENCE CLUB

The Clemson Poultry Science Club was reorganized October 24 after several years of inactivity. The recent reorganization was made possible by an increasing number of poultry majors at Clemson. Students interested in poultry saw the need for organizing a club that would permit a close association of students and promote a better relationship between the professors and students. It is also expected that an active club sponsoring worthwhile projects will stimulate more interest in the poultry industry and in the study of poultry science. The club begins with 11 members with expectation of increased participation in the near future.

The purpose of the club is to further the social, cultural, and scholastic activities of the students who are members of the Poultry Science Club, by working together as a team and in cooperation with the faculty of the Poultry Department. The formal training received in the classroom provides the primary benefit to a college student, but it is recognized that extra-curricula activities are an important part of college life. Club members learn how to conduct meetings and transact business in an effective manner. Club meetings provide an opportunity for members to express themselves before a group and to engage in the give and take of organized group activity. A recent study of "problem employees" indicated that the vast majority of people who lose a job, do so because of their inability to work with people. This suggests that an understanding of human nature is at least as important as technical knowledge in one's specialized field. The Poultry Science Club expects to provide the opportunity for people with technical knowledge to learn to work together. Projects that provide income permit students to participate in inter-collegiate activities and to take extended field trips for study of the industry in this state or in other areas.

Thomas E. Webb, poultry major fro Saluda, was elected president for the 1961-62 school year. Reuben R. Macfie, pre-vet major from Winnsboro, was elected vice president, and Furman M. Gregory, poultry major from Union, was elected secretary-treasurer. Frank M. Senn, Jr., poultry major from Newberry was elected reporter. The Advisory Council consists of B. D. Barnett, Chairman, James B. Cooper, Merritt A. Boone, and Thomas C. Stewart.

Club projects under consideration include a sale of turkeys to the Clemso faculty and community, chicken barbecue for communities and clubs throughout th Piedmont area, and a possible egg art show just before Easter.

WHAT ABOUT UNIONS

by

Jim Hite

There is a growing interest among American agriculturists in the current attempt to persuade farmers to join the organized labor union movement. For a long while, in many areas, farmers and organized labor have found mutual political benefits in common fronts, dating from the Populist Party of Georgia's Tom Watson in the late nineteenth century to the Minnesota Farmer-Labor Party of Hubert Humphrey. It is true that for some time farmers have organized unions of a sort in their marketing cooperatives which have sought to increase farm bargaining power, particularly in such commodities as milk and truck crops, but farmers' unions, affiliated with other groups in the broad spectrum of industrial labor organization,have never been very successful. Recently, however, new and energetic action by some segments of the labor movement has met with a measure of success, particularly among small farmer operators and hired workers.

Agriculture, unlike many industries, does not lend itself well to unionizing. The farmer is often both a laborer and a manager. He cannot strike against his own management; therefore, if the long-standing union tool of striking is to be used, it must be directed against the buyers of farm products. Yet these products with the exception of fluid milk and a few other commodities, represent a season's work and considerable capital. also, they are often so highly perishable that the farmer finds himself under great pressure to sell for what he can quickly get and salvage something, rather than to take a chance on losing his entire crop in lengthy negotiations for a better price. For this reason, farm strikes have not been very successful in most agricultural products.

Also the farmer is reluctant to surrender a portion of his prized autonomy and particularly so to the industrial labor union which he distrusts as ultra-radical, boisterous and dominated by the big-city racketeer. Current publicity on labor leaders, like James Hoffa, Dave Beck, and Harry Bridges, and the corruption and mismanagement disclosed in some unions by congressional investigations, have certainly done little to cause the farmer to rush headlong and embrace union membership.

If unions cannot offer the advantage of collective bargaining, and if they seem to be highly susceptible to corruption and communism, why do they have an appeal for agriculture? There are three major reasons. First, farmers are already dependent upon unions for the supplies and services necessary to their operation and the marketing of their products. In order to insure that these vital services will not be cut off, they feel a need to ally themselves with labor unions. Second, while the actual withholding of most agricultural products from the market as a form of strike is not feasible, a large union with power in the food processing industry could exert considerable pressure in the area of farm prices. Third, the increasing realization by some farm operators that union inroads in their labor supply, particularly in migratory labor, will place them in severe economic strain if they do not have union support in getting their own incomes raised.

There are other factors, of course, which are important too. The growing fear by small farmers that the "Big Man" is going to force him out of business. The small farmer's dissatisfaction with the political policies of the American Farm Bureau and other organizations have made him dependent upon the farm lobby in Washington. This is coupled with an awareness of the declining influence of farm lobbyists because of population shifts which are decreasing rural representation in Congress, and a knowledge that union influence is likely to remain strong and be especially helpful in getting votes from city congressmen for farm legislation.

Agriculture is faced with a declining numerical position in the American population and at the same time with a technological revolution that reshaped the production phase of farming. These twin developments have created some grave social, political and economic problems. The labor union movement seems to offer some answers. If it can rid itself of the stigma of communism, racketeering, and bossism which have grown up around it, it may well find that the sixties will enable it to move into the last great non-union industry - agriculture.

TIPS FROM A TRIP

TIPS FROM A TRIP

by

Jimmy Cothran

South Carolina is indeed blessed with many fine, historic and monumental gardens, public as well as private. Last spring the advanced landscaping class, of which I was a member, set out on a field trip to make a study of some of the most outstanding ones.

Our trip began as we headed for the "Low Country" to first view some of the historic gardens of Charleston which grow from sheer swamps and have stood the test of the Revolution, the War Between the States, and earthquakes, as well as the endurance of time. Our first stop was at Middleton Place, situated between Summerville and Charleston. No one can imagine the fascination of this mellowed old estate until visiting it. Time has matured the garden into a paradise of plant material which literally fires the imagination -- Camellias large enough to form tunnels composed of foliage and blossoms; azaleas in such quantity and color that one has never seen; prodigious Live oaks which blot the premises and add to the very air of antiquity that prevails; cascading parterres which reflect the work of slave labor combined over many years to create a wonderful effect of form and structure; and the silent and serene waters of pools and sinuous lakes which reflect and display a spectrum of color and form.

Stopping next at Magnolia Gardens, we found ourselves in a garden that has matured into a masterpiece. This garden was fashioned through the care and precision of John Drakton, an Episcopal minister, in 1840. This garden contains many indigenous plants as well as a tremendous collection of imported ones. The earlier specimens have matured into shapes and sizes of unimaginable magnitude.

The trip then continued into Charleston, and we began on foot. As we walked the narrow cobblestone streets we began to seek out private gardens hidden behind walls which customarily encompass ones premises. These"clandestine" gardens, so to speak, which are hidden from public view, are fashioned into fascinating effects.

Because of the limited area, the gardener has sought to utilize every available inch of space and has created phenomenal results. Plant material has been selective, and many walks and borders have been devised and planned with false perception in order to give the feeling of unlimited spaciousness and capaciousness. Mirrors, statuary and small intricate terraces have been fully utilized to portray such effects. The true artistry of these gardens leaves one with a full awareness of the ingenuity of their creators.

Continuing the next day, we next made a stop at Cypress Gardens. Cypress Gardens in actuality are floating gardens. Fashioned out of swampland, the primary means of viewing these gardens is by boat. As one of our able-bodied professors had walked us ragged in Charleston the day before, you can certainly understand the satisfaction we received by being rowed through a garden instead of the conventional walking. The ride carried us through dark, silent waters, towered on all sides by giant "Bald Cypress". On all sides there were flowering azaleas and camellias which compose the majority of its plant composition.

Continuing up the coast, we next stopped at Brookgreen Gardens. Even though we toured this garden in the rain, it was well worth the discomfort. In essence, Brookgreen is actually a display of statuary in a garden setting - the combination being spectacular. This garden is constructed on the site of an old rice plantation and the original avenue of Live Oaks which lined its entrance compose the central hub of this garden. In addition to containing many imported plants, there is a sizable collection of material including trees, shrubs, and many wild flowers which are indigenous to South Carolina.

Biltmore Estates and Gardens of Asheville, N. C., while not in our native state, again offers excellent study in landscaping endeavors. Represented at Biltmore are the efforts of design of Mr. Olmstead, who is also accredited with the design of the famed Central Park in New York. There is diversity at Biltmore - its Italian gardens, shrub gardens, rose garden, and the collection of native azaleas in the azalea garden. Each of these gardens is truly an exceptional work of art.

After visiting the previously mentioned gardens on several field trips, I have concluded that until a student can actually see what can be created with the fundamentals given him in class, he cannot appreciate his learning. Not until he is aware of what others in his field have achieved, can he work for such achievement. Not until he is awed by example, can he determine the value of his education. In return, his efforts are encouraged and his pace becomes motivated. This, in essence, is the value of "the tips from a trip".

RADIOACTIVE AGRICULTURE

A. N. Plant

The fission process accompanying an atomic detonation produces about 200 separate isotopes. Most of these isotopes are short-lived and although they present very great immediate hazards, generally they do not present land use problems. Most long-lived fission products are not removed from the soils by plants. However, strontium-90 is an exception. Strontium-90 is chemically similar to calcium and, therefore, it is taken up by plants and is assimilated in animal bodies. Thus it can be found in fresh vegetables, milk and meats.

Until the recent Soviet series began, atomic detonations of all nations had produced a total of approximately 170 megatons yield. During 1954-59 the annual strontium-90 fallout due to these tests was about 10 millicuries per square mile and was decreasing greatly following the cessation of large scale nuclear testing in 1958.

The U. S. Weather Bureau has estimated that by the end of next spring fallout from the recent Soviet tests (30 detonations totaling about 115 megatons yield) will have blanketed the United States with 50 to 100 millicuries of strontium-90 per square mile. Strontium-90 fallout in South Carolina, as well as most of the eastern United States, will have approached the 100 millicurie range.

From an agricultural approach, strontium-90 palatives include food selection, decontamination of food and land, and new patterns in agriculture.

Foods could be classified according to their strontium-90 content. Foods lowest in strontium-90 content could be reserved for children and young women; while foods higher in strontium-90 content could be apportioned according to the susceptibility of individuals to injury. Supplemental calcium in the diet would also lower the strontium-90 calcium ratio, thus reducing the strontium-90 uptake by the body.

Certain foods could be subjected to decontamination processes. Replacing strontium-90 with calcium in various foods could be affected. Certain refining processes, such as that used in the extraction and purification of sugar would remove nearly all of the strontium-90.

Refining processes would fit well with new agricultural patterns. A shift of heavily contaminated lands to production of timber, cotton and sugar crops could become necessary, depending upon the nature of the land contaminated. Moderately contaminated land could be planted in grains or forages, and relatively "clean" land could be reserved for vegetable production.

Research to cope with the land decontamination is being conducted. In fact, two experiments are located in this region, one at Watkinsville, Ga., and the other at Florence, South Carolina. If the land is highly contaminated, removal of the surface layer is probably necessary. However, on moderately contaminated land, cultural practices might reduce the strontium-90 uptake by crops. Burial of the contaminated surface layer by deep plowing, followed by proper applications of lime, fertilizer and moisture appears promising.

These practices are, in reality, a relief without cure. The cure can come only from man --- the cessation of nuclear testing.

THINK IT. OVER

In the past The Agrarian has been one of the leading agricultural student publications in the nation. Several years ago its financial source became depleted and the publication ceased. Thanks to the great effort of Jere A. Brittain and his staff, The Agrarian began publication again last year.

The editor feels that there are companies and individuals who would be more than glad to sponsor an edition of The Agrarian, or it could be published jointly by several companies or individuals. If money in excess of the amount needed for publication is accumulated, an Agrarian scholarship could be set up. This would tend to interest more people in choosing agriculture as their major field of study.

The Agrarian serves not only Clemson College and its School of Agriculture, but the entire field of agriculture in South Carolina. Every Vocational Agriculture Teacher and every High School library receives a copy of this magazine. Because of this, the contents of The Agrarian touches thousands of individuals in this state. Through it, agricultural information from Clemson is disseminated throughout the state. Therefore, our future will have a vital effect on the agriculture of the state and your support determines our future.

Won't you help The Agrarian promote agriculture in South Carolina?

Great advancements have been made in agriculture in the past fifteen years. The main objective of agriculture in the past was production, but recently the objective has shifted to business and science.

In 1890 the average person had a hard time producing enough food for his family. Today, one person can produce enough food for twenty-five people. This has come about through an evolution of science.

To keep pace with ever-changing agriculture, new curricula have been established in the School of Agriculture at Clemson. Students can now also choose an option in business or in science.

TALL CORN

A tractor salesman was going along a back country road when he saw a farmer plowing his field with a bull hitched to the plow. Thinking this should be a likely prospect, he stopped his car, got out and approached the plower.

He made his pitch and then asked the farmer if he wouldn't like to buy a tractor. The farmer replied, "I've got a tractor in the barn."

"Then why in the world are you using this primitive method of plowing?" returned the salesman.

The farmer answered, "I aim to teach this critter there's something else in life besides romance!"

-

The main difference between a democrat and a republican is that a democrat sells what he cannot eat and a republican eats what he cannot sell.

-

An "old timer" who graduated from Clemson years ago was asked why he was a democrat. He said, "Well, my father was a democrat; my grandfather was a democrat; so I am a democrat.

The friend who was asking him said, "That is no basis for you being a democrat. What if your ancestors had been crooks and horse thieves?"

He said, "In that case I guess I would have been a republican."

-

A farmer went to the school house and greeted the faculty at a P. T. A. Meeting. He met the first grade teacher and said " I am the father of those twins you will have in September."

"What's the matter here," asked the policeman of the battered man lying on the sidewalk outside an apartment house.

"Oh, just absent-mindedness," was the reply.

"What are you talking about?" retorted the cop.

"Well, you see, I live on the fourth floor of this building and both my wife and I are very absent-minded I just got home from a business trip and my wife and I were at the dinner table when a step sounded in the hall and someone tried the door. Well, my wife is so absent-minded that she said, "Goodness, here comes my husband," and I'm so absent-minded that I jumped out the window."

-

Census Taker: "How many bushels of corn did you raise last year?"

Backwoodsman: "Didn't bushel it -- bottled it."

-

One of the great mysteries of life is how the boy who wasn't good enough to marry the daughter can be the father of the smartest grandchild in the world.

-

Whether a man winds up with a nest egg or a goose egg depends somewhat on the chick he married.

-

Sign on winding highway: "These curves are different; they get more dangerous after you pass 65."

-

It takes no high-powered scientists to explain -- or figure out -- the philosophy expressed by a hard-working negro woman who was asked why she put up with her likable, but completely lazy husband: "Well, I makes de living and he makes de living worthwhile."

-

It takes girls longer to dress because they have to slow down for curves.

- - -

MEET YOUR FROZEN FOOD PLANT

The Harvest Issue of The Agrarian is presented by The South Carolina Frozen Food Locker Association. In sponsoring The Agrarian, this fine organization marks itself well as a proponent of agricultural journalism and scholarship. The Agrarian staff members are deeply grateful for this support.

In the interest of informing the reader of this vital member of his community, some comments from two leading members of the association are presented below. These spokesmen are, Mrs. Bernice Gambrell, Manager of Hinsdale Quality Foods, Greenville, S. C., and L. O. Van Blaricom, Professor of Horticulture, Clemson College, and Secretary-Treasurer of the Locker Association.

"The South Carolina Frozen Food Locker Association is a group of independent business men, representing the community frozen food locker plants of South Carolina. Formally organized in 1945 during the latter part of the war, in an effort to work more closely with the Office of Price Administration and War Production Board, the association was incorporated in 1950 as a non-profit organization of South Carolina. As stated in their declaration and petition for incorporation, the purpose of the corporation is "The advancement and improvement of the frozen food locker industry by encouraging and fostering high standards and sound business practices; promoting educational and research work; obtaining interchange of information between members; increasing the efficiency and usefulness of the industry to the general public." Members of this association have always been interested in research and education, and on many occasions have held their annual and summer meetings at Clemson College.

The community frozen food locker plant has been and is still a big asset to any community. These businesses offer many services not only to the farmer, but to urban dwellers as well. Besides providing locker rentals, the early locker plants processed farm produced meats. This service included slaughtering, chilling, aging, curing, cutting, wrapping, quick freezing, and storage of meats.

In general, locker box rentals have dropped off with the increasing use of home freezers and the more readily available frozen foods from grocery stores and supermarkets. With this decrease in locker rentals, many plants have expanded in function to include other items such as processing of fruits and vegetables, the wholesale meat business, production of specialty items from local products, merchandizing of commercially-packed foods, production of portion controlled servings of meats for restaurants and hotels and the servicing of home freezers.

The community locker plant business was originally based on the salvaging of farm produced meats in the early days of the '29 depression. The plants have always offered services of benefit to the farmer at most reasonable prices. It is one of the places where real value can still be obtained. Where else can meat be slaughtered, dressed, chilled, cut into retail cuts, quick-frozen and stored for approximately seven cents per pound?

Locker plants are also a splendid source for getting to the public the research that has been done by our colleges and universities, together with the U. S. Department of Agriculture on preparing food for freezing. Educating the public on the correct way of preparing food is a continual process."

South Carolina Frozen Food Locker Association

This issue of THE AGRARIAN is sponsored by the following members of the SOUTH CAROLINA FROZEN FOOD LOCKER ASSOCIATION

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THE COVER

Nothing signals the coming of Spring like the peach blossom in South Carolina. With the advent of warm blue skies, the land bursts forth in pink flowers and the air is filled with sweet fragrance. Now one of the major crops of South Carolina agriculture from the rolling orchards of Spartanburg County to the Sand Hills, the peach industry each year adds millions of dollars to the pockets of South Carolinians. *The Agrarian* is pleased to salute "King Peach" in this, our Planting Edition.

THE AGRARIAN

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Dear Agriculture Students:

It is certainly a privilege to have an opportunity to sponsor an issue of your fine agriculture student publication, the Agrarian. As you know, our organization is the only official organization which represents all growers and deals primarily with the interests of peach growers in production and marketing. We are keenly interested in the functions of Clemson College and the School of Agriculture, particularly from the standpoint of research and extension. It is through this service that we receive the information needed for production and marketing of peaches of fine quality.

However, we recognize another great value of Clemson and the School of Agriculture to South Carolina. We recognize the value of teaching, whose end product is fine well-trained young men who will be the leadership of agriculture in the future. It is with this in mind that we are sponsoring this issue of the Agrarian.

With best wishes and kindest personal regards, I am

Jerrold A. Watson

Jerrold A. Watson, President
South Carolina Peach Council

"A Peach for the Trapper"

Dennis A. Abdalla

A big burly Canadian trapper was visiting a large supermarket in Montreal for the first time. At the fruit counter he spied an attractive display of big, juicy, fuzzy, golden-red fruit.

"By Jiminy, what is that fancy looking thing?" he asked the counter boy who was just opening another bushel.

"Why those, sir, are South Carolina peaches. Try one," he replied. The trapper dug into one.

"Wow, that there thing is nothing but 'de-lish'. It sure must take some know-how to grow a victual like that."

"Well," said the counterboy, "you just grab yourself an empty bushel basket, have a seat and I'll tell you all about it. Gosh, I thought everybody knew about South Carolina peaches."

"Montreal is only one of the large receiving points for fresh South Carolina peaches. Right now South Carolina is second only to California in total production. On the fresh market 6372.8 freight carlot equivalents were shipped in 1961. Now that's no drop in the bucket."

"About three years after the baby peach trees are planted they begin to produce large, round, plump fruit buds that open into beautiful pink or white blossoms. This is peach-blossom time down South, and people come from miles around to see this immaculate display. Well, a little later the petals begin to fall and tiny little green peaches begin to form in their place. These peaches continue to grow and grow and grow until they get like the one you just ate."

"Well, that don't sound like much know-how to me," grumped the trapper.

"Oh, I'm not finished yet-- you just hold your horses a minute," said the counter boy. "When those little baby trees are growing up they have to be fertilized with just the right amount of nitrogen, phosphorus and potassium. Then they have to be pruned just right. The 'open-vase' method of training is used so enough light gets in and its branches are well distributed to hold its future peaches."

"That sounds a little more complicated, but still not too much," replied the trapper.

"Now listen to this," the counter boy continued, "when those little babies become adults in about five years and are bearing a heavy crop, they have to have their blossoms thinned to about 8 inches apart. How about that? If they aren't, then the fruit will be small and have poor flavor. They do a lot of this thinning by hand but now are experimenting with phytoauxin sprays which look like promising time savers."

"Phyto-who-what," remarked the trapper. "That's a dilly."

"Yes sir, phytoauxin sprays, and that's not all. They have great big spray rigs that would take about 20 of your dog teams to pull that keep off bugs and fungi and stuff. These sprays are insecticides and fungicides that have been developed by extensive agricultural experimentation. Chemicals like wettable sulfur for blossom blight, Captan for brown rot, and Guthion for curculio -- that's a bug. These all have to be mixed and applied at exact amounts to get so many ppm (parts per million) or so much percentage on the trees. And to boot, these sprays are put on a total of no less than 10 times to get perfect control and top quality fruit."

"Boy, it would take a 'dern' top-notch Captan (Captain) to run an outfit like that," commented the trapper.

"Now when these 'peacharoonies' are in full production you have to change the fertilizer program - cut down on the nitrogen supply. Too much nitrogen makes all leaves and no peaches. At the same time you have to put on more potassium to bring out that nice rosy cheek like you see on those peaches there. They apply what they call a 6-9-12 fertilizer at 800 to 1,000 pounds per acre, which means the trees get about 54 pounds of nitrogen, 81 pounds of phosphorus and 108 pounds of potassium per acre. All that figurin' must be done, see? Then you have to keep the weeds knocked out so they don't compete with the trees for water and nutrients - that's another big job. Then comes July and those big, golden-red 'fuzzie-wuzzies' are about ready to pick and send here and there. Here comes a need for more know-how! When is the right time to pick; how should they be packed; and at what temperature should they be held in the refrigerator car? You've got to know it all. So now you know what you have to know about growin' that big South Carolina peach - right?"

"Son, I sure enjoyed the information on them there peaches and sure will be a-buying 'em and eatin' 'em, but I'll leave that peach growing business to the South Carolina man, because he sure knows how it's done."

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Then there was the family who named their dog Carpenter because he did odd jobs around the house.

****

Mother, putting junior to bed: "Shh -- the sandman is coming."
Junior: Fifty cents and I won't tell Daddy."

Time - Your Most Valuable Possession

Jerry L. Moore

(The following is a synopsis of a speech prepared by Mr. James K. Henderson, Asst. General Sales Manager of Carnation Milk Company in Houston, Texas. Mr. Henderson graduated from Clemson with a B. S. in Dairying in 1955.)

It's not in your wallet nor your bank account. You can't earn it, borrow it, or hoard it. In fact all you can do is spend it. What is it? It's time, of course, the universal coin of achievement which is equally available to all.

Robert Ripley, in "Believe It or Not" once said that a bar of iron could be made into $10.50 worth of horseshoes, or $355 worth of needles, into $3,285 worth of penknife blades or into $250,000 worth of watch balance springs. People utilize time in an analogous manner - many converting their time into the value of horseshoes, while few - very few - convert their time into the value of watch balance springs.

Can you honestly say that you are using your time in the most fulfilling and profitable way? Are you daily satisfied with your accomplishments for that day?

True, time can't be saved and used later, but every minute can be more efficiently used by acting on the following four-step plan: (1) Define your goals, (2) work out a definite program, (3) set up time-tables, and (4) concentrate on essentials.

First, define your goals. Define them according to your business or professional ambitions. Make your goals specific. What are the goals you have for your family or family-to-be? Include self-improvement goals to assure continued personal growth through travel, friendships, reading, athletics, etc. Christian goals and actions are very important parts of your list of defined goals.

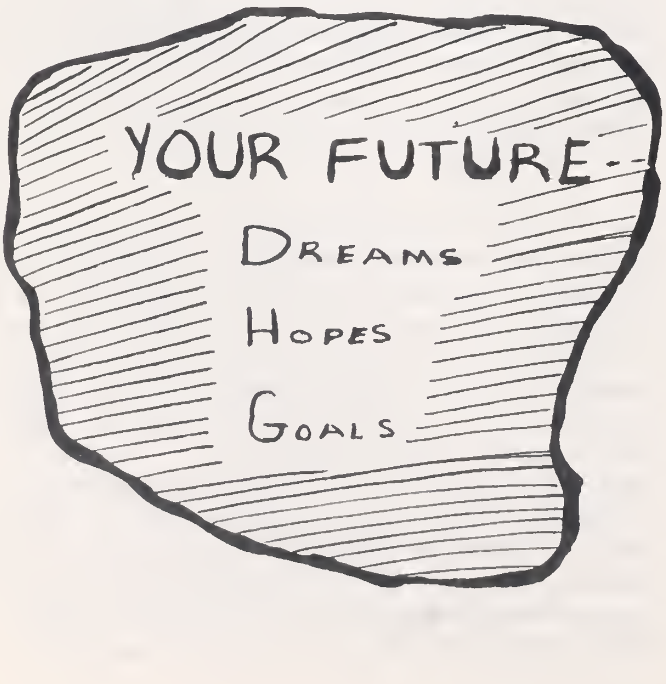
Now after defining and listing your goals, you should work out a definite program. Action involved in setting up a definite program will breed the action necessary to carry it out; success will breed success. Achievement of this goal, to work out a specific program, and other small goals will increase your determination and ability to achieve increasingly larger goals. Your program plan should provide rewards for the accomplishment of goals. It should be in writing to provide a concrete basis for your actions. More important then is turning this program plan into an active program.

After defining your goals and working out a definite program, schedules or timetables should be established. Schedules are necessary to be sure your goals and actions are carried out in an orderly sequence. Time limits or deadlines can aid you by challenging you to your greatest effort, alerting you to tasks that must be done, and by giving you the affirmative idea that you can accomplish the given goal. Prevent loss of confidence and frustration that stems from failure by keeping constant check on your schedules and time limits to make them realistic, but challenging.

Finally, concentrate on essentials and eliminate all the unnecessary steps in your goal achievement efforts. The point is, don't spend dollar time on penny jobs or effort. Don't spend time worrying about mistakes and failures. Be elastic enough to bounce back, and realize that all efforts involve profit and losses. Spend time today working toward your goals for tomorrow, not rectifying or worrying about yesterday's mistakes. Likewise, don't get in debt to yesterday by postponing actions that could be finished today.

Once again the four basic principles in the efficient use of your time are: (1) Define your goals, (2) work out a definite program, (3) set up time schedules and time limits, and (4) concentrate on the essentials. Won't you set these principles into action? Nothing can be attained from knowing these principles, but much can be attained from actively using these principles.

You can carry out these principles if only you will learn to discipline yourself with the three following resolutions: "I can", "I want to", "I must" make more efficient use of my time. Do more of the things you know you should do and they soon become genuine pleasures, but do more of the unnecessary things you simply want to do and they soon become habits almost impossible to break.



Bacterial Spot of the Peach and its Control

Dick Holstein

Bacterial spot, also commonly called bacteriosis, is one of the most important diseases of peach trees in South Carolina. As the name implies, the disease is caused by a bacterium, Xanthomonas pruni, that enters the fruit, leaves, and twigs of the peach through the stomates. The stomates are tiny, natural openings connecting internal tissue with the outside atmosphere. The organism may also enter through wounds.

Once inside the plant the organism multiplies and kills small pockets of cells. These small pockets on the leaves first appear as small spots, a little lighter in color than the surrounding tissue. As the disease progresses, the spots become larger and darken to a deep purple, brown, or black. The dead tissue separates from the living tissue and drops from the leaf, leaving the characteristic "shot-hole" appearance. Badly infected leaves turn yellow and drop off, especially on non-vigorous trees.

On the peach itself, bacterial spot is first evident as small circular brown spots on the surface. As the disease progresses the spots become darker and sunken. The spots may be few, or so numerous that they cover large areas of the fruit. When these spots are present, the quality of the peach is reduced, even though there is little damage beneath the surface. However, the fruit produces callus tissue to seal off the dead area from the living, and this callus tissue will not stretch. Therefore as the peach grows the callus tissue does not expand, and cracks appear on the fruit. A peach in this condition may not be marketable even as a cull. The size and number of cracks is dependent upon the number of spots on the fruit and the size of the peach before infection. Therefore, it is obvious that early infection is more serious than late infection.

A peach free of spots will find a ready market

The losses incurred from bacterial spot can not be evaluated by the loss of marketable fruit alone. Usually, the most serious aspect of the disease is its defoliation of the trees. In a bad year, 15 to 30 per cent of the leaves are commonly lost. As the leaves are lost, the tree's capacity to manufacture food is reduced, and the obvious result is the weakening of the tree. Weakened trees may be incapable of supporting a crop, and the result is reduced quality and quantity. Also, a tree entering the winter months in a weakened condition is more likely to be killed by low temperature cold injury; and even if the tree survives the winter it will lack the food reserves to produce a good crop in the succeeding year.

A very important method of reducing the severity of bacterial spot is proper fertilization. Vigorous trees resist the disease; weak, inadequately fertilized trees are susceptible. Therefore, keeping the tree "healthy" through proper orchard management insures not only maximum production but also improved control of bacterial spot.

As far as chemical control is concerned, there is no "sure-fire" material, but zinc is the most helpful when used in a full program each season. The most successful spray program consists of weekly zinc sprays beginning when leaves are ½ inch long. After five applications at one-week intervals, zinc applications should continue at two-week intervals until 30 days before harvest. The most commonly used form is neutral zinc applied at the rate of three pounds per 100 gallons. Neutral zinc is compatible with parathion. It is important to note that to obtain maximum benefit from zinc this program should be followed each year and not just during years when the disease is severe.

Sulfur should be used as the fungicide, when zinc is used, to minimize foliage injury. Captan-zinc mixtures are more injurious to foliage than are sulfur-zinc mixtures, which cause only slight injury to the first leaves.

Perhaps the best control of bacterial spot is the use of resistant varieties when applicable. Red Haven, Ranger, Loring, and Redskin are resistant and, although they are not immune, zinc may be eliminated from the spray program.

There is another control "gimmick" used by peach growers which is worthy of mention. Since the organism can also invade through wounded tissue, a method has been devised to reduce injury to fruit and leaves during spraying. This is done by putting a wind shield at the bottom of the blower, which then draws the air in from the sides and reduces the amount of sand and debris blown on the trees. This prevents wounds caused by airborne sand, which could serve as infection sites. There is no scientific evidence to back up this method, but growers who use it seem to think it helps - and against bacterial spot we need all the help we can get!

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Cooperation is not a sentiment - it is an economic necessity.

Charles Steinmetz

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Dollars and sense do not always travel together.

Prochnow

****

No machine can do the work of one extraordinary man.

Elbert Hubbard

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Orchids at Clemson

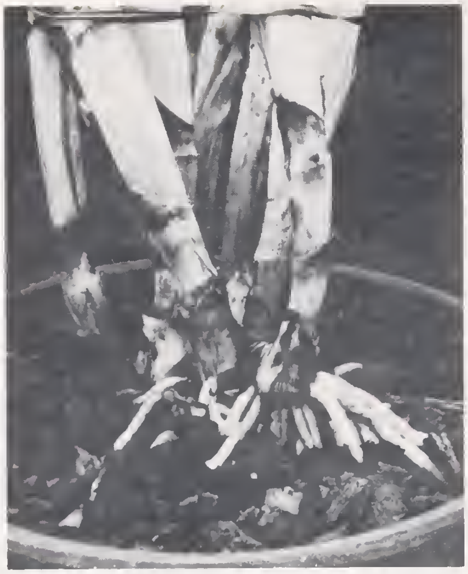
Robert G. Halfacre

There are no members of the plant kingdom embracing more varied and more charming qualities than orchids. These fascinating plants are becoming more and more wanted throughout the world and, consequently, more carefully studied and technically cultivated. On the whole, the orchid is an epiphytic plant and grows most commonly in tropical parts of the world. However, there are orchids naturally in the United States and in areas farther north. There are orchid plants and flowers of many diverse sizes, shapes, and colors. The orchid family, which is the largest of the plant families, is composed of approximately 15,000 different species.

Until June of 1961, Clemson College did not have more than a handfull of orchid plants. At that time, however, two collections were donated to the college by the families of the late Joseph M. Costello of Columbia, South Carolina, and Frederick A. Klein of Augusta, Georgia. The moving of these collections hurt them greatly, but with tender care all but a few of the 752 mature plants survived and are doing well. In addition the college was later given the collection of the late Mrs. Sheffield Phelps of Aiken.

Most of the plants were in osmunda, a medium obtained from fern roots. As the need for repotting the plants becomes apparent, we are replacing them in a medium of fir bark rather than osmunda. This bark is composed of 80% California white fir and 20% ponderosa pine. The cost and the difficulty of using osmunda as a medium necessitated the change. (Picture 1). Here we see a typical plant after about two years of growth showing the need for repotting. You can also see the nature of the growth by the rhizome on a horizontal plane.

Before we try to remove the plant from the pot we first soak it in water overnight, and then with a dull knife we can loosen the roots without damage. Then we trim off all of the old roots and place the plant in the bark not watering it for about five weeks except its foliage with a mist nozzle.



Picture 2

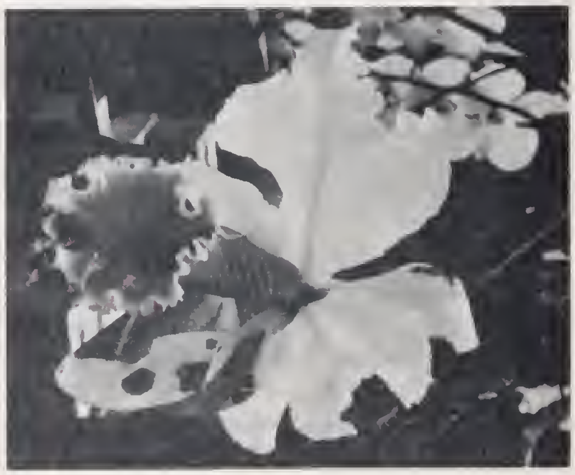
(Picture 2). Here we see a Cattleya about four weeks after being repotted. You can observe the new root growth.

In their native habitat, orchids grow clinging high up in the trees. It is often not understood that the bark to which they are attached and the accumulation of leaves and other decaying material give up considerable food to the intertwined and circling masses of roots. Successful growing in bark depends on the availability of totally soluble fertilizers formulated for orchid growing that can be easily applied to the plants when watering. At present we are fertilizing every three weeks, using a 100% organic fish fertilizer, in concentration of 1 tablespoon per gallon of water.

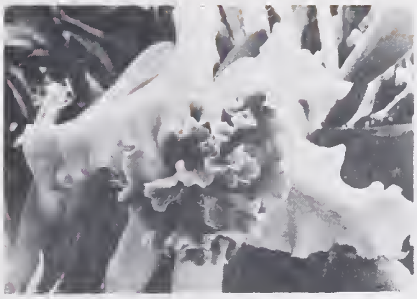
An occasional change in fertilizer is advisable, for like ourselves, plants may get certain nutrients from one formula that are missing entirely in another. By this procedure, we are planning "well-balanced meals" over a period of time. As the bark gets older in the orchid pots, it tends to increase its moisture-holding capacity, which in turn increases the retention of the fertilizers.

At Clemson we keep the day temperature between 65° and 70°F. and the night temperature between 60° and 70°F. Our humidifier system keeps the relative humidity around 67%, but we must water the plants about twice a week during the morning or early afternoon, so the leaves will be dry before night. Water left overnight on the foliage may stimulate disease and rotting. We allow about 20% to 30% of the direct sunlight to enter the greenhouse in the summer and 80% to 85% during the winter. Too much light causes burned spots on leaves and too little causes spindly, slender plants which will not bloom. Our plants are located on benches with elevated shelves made of redwood slats. This arrangement was made so that the plants could receive good ventilation.

Slugs and snails cause a great deal of trouble in raising orchids. In order to control them, we have been using metaldehyde, being sure to apply it at extra strength under the benches and on lower walls. (Picture 3.) This is a picture of slug damage to a Cattleya bloom in our orchid house. As you can see, this bloom has been partially eaten by slugs, which do most of their damage by night. During the day they remain hidden in the pots and beneath the benches.



Picture 3



Picture 4

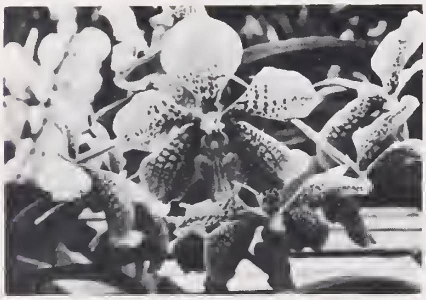
Almost any orchid plant can and will produce a freak bloom in its lifetime. A sudden shock, insufficient light, or any other cultural deficiency may be responsible for the production of freak blossoms. Occasionally a plant will produce many consecutive freaks. When this occurs the plant is usually discarded. (Picture 4) As you can see, this Cattleya has a double throat.

Picture 5

(Picture 5). Here you may observe one bench of our orchid collection in bloom. As you can see, most of our plants are Cattleyas but we also have a few specimens of other genera. They are housed in a steam-heated greenhouse thirty-three by twenty-five feet.

Picture 6

(Picture 6). This is a Dendrobium, which is native to Southeastern Asia. The flowers which they produce are charmingly colored and vividly marked. The lateral sepals of the blossoms are joined to form a more or less prominent spurlike chin. The lip, as you can see here, is highly colored and larger than the other floral segments. Dendrobiums grow rapidly and can be easily propagated.



Picture 7

(Picture 7). The Vanda, shown here, is a genus of sun-loving plants. These are the orchids which are used in leis in Hawaii. Their fragrant flowers are beautifully shaped and exhibit a wonderful blend of colors. They are of excellent texture and are adaptable to many uses because of their long-lasting blossoms.

Picture 8

(Picture 8). Here we see a member of the Cypripedium genus, which is found in virtually all of the temperate and subtropical regions of the globe. They are known commonly as "Lady's-Slippers" or "Moccasin Flowers" and are characterized by showy flowers that are mostly pink, green, brownish-yellow, or white in color. They also have a prominent pouch-like lip and two fertile anthers instead of a single one found in almost all other orchids.

Picture 9

(Picture 9). This is a member of the genus Phalaenopsis, commonly known as the "Moth Orchids" which is extremely popular both with hobbyists and with commercial growers. This plant is so generous with its blooms that it often produces a second and even a third spray after the first one is cut. The white blooms of this genus are especially valued for wedding bouquets.

Picture 10

(Picture 10). To almost all of you, the Cattleya blooms, shown here, are probably the best known of all orchidaceous plants. They make up about three-fourths of our collection. The Cattleya has a large lip with two side lobes which fold up to form a tube around its column. The lower part of the lip which is called the middle lobe is continuous with the side lobes. It spreads wide and is handsomely ruffled and richly colored. There are two wide flaring petals and three evenly spaced sepals around this lip. When you consider the Cattleya's beauty and long lasting quality, it is easy to see why it has found favor as the most valuable of the orchid genera.

This past month we began conducting extensive research with our orchid plants, studying various growing media, cultural methods, and fertilization. We shall attempt to improve old methods and experiment with new ones.

In earlier days the orchid was exciting because of its rarity and the fact that so little was known about it. Today, orchids are more common, but we have only scratched the surface in our search for knowledge of orchids and their growth. This alone is enough to make the orchid family the most interesting of plant families.

TALL CORN

Several years ago, a rabbit, a buzzard, and a turtle, who were real good buddies, went west to acquire their fortune. When they arrived they set up camp and drew straws to see who would return to the old place and get a much needed load of manure for their crops. The rabbit was chosen for this chore.

It took the rabbit several weeks to return and when he did, he saw a large mansion where their camp had been. Not knowing the buzzard and the turtle had discovered oil while he was gone, he knocked on the door and a fancy butler answered.

The rabbit, in his common way, asked for "Buzzard" and "Turtle."

The butler replied that Mr. Buzz-ard was in the yard and that Mr. Tur-tell was at the well.

Taken aback, the rabbit thought for a minute and said, "Will you please tell Mr. Buzz-ard in the yard and Mr. Tur-tell at the well that Mr. Rab-bit is back with the --er--manure.

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A farmer is a man who stands out in his field.

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We the staff of The Agrarian welcome your comments and criticisms on the material it contains as we strive to publish a magazine interesting and informing for you, the reader. Write:

Editor, The Agrarian
% Horticulture Department
Clemson College
Clemson, South Carolina

Subsoiling

Boyd Loadholt

The problem of soil compaction is one of growing interest on the part of Agricultural Engineers, Soil Scientists, and operating farmers.

It is generally assumed that hardpans in soil profiles are very hard layers of varying thicknesses which usually occur six to ten inches below the soil surface.

Several types of hardpans occur in the soils of this country. The pan presenting the largest problem in the soils of the eastern seaboard is known as an induced hardpan. The rate and ease of formation of an induced hardpan is directly related to the moisture content of the soil. An engineer named Proctor theorized "that moisture acts as a lubricant which reduces the frictional resistance between soil particles and increases the amount of compaction for a given applied force up to the point where water fills the soil voids."

It was found that the soil moisture content which was ideal for soil compaction was also ideal for tillage on certain soil types. The tractor tires compacted the soil to a depth of 9 inches, which is below reach of normal tillage apparatus.

Those soils where the restrictive layer is the result of a recently applied compacting force are most common in medium textured soils and soils of low organic matter. When soils of this type are under a continous cropping system, the presence or development of a hardpan is almost certain. In the Coastal Plains of South Carolina soils of this type are numerous.

Hardpans have a pronounced effect upon the infiltration rate and the amount of plant growth on a soil. Roots are usually very slow to penetrate a severe pan.

What is the advantage of subsoiling and deep placement of fertilizer? If no hardpan or compacted zone is present in the soil, or if rainfall is sufficient during the growing season the practices mentioned above will not be economical. After a hardpan has been shattered, the root systems of most crops will be greatly increased. As the root system enlarges, the size of the area from which water and nutrients are drawn is also enlarged.

Another possible advantage that may be obtained from deep placement of part of the fertilizer is the availability of deep-placed plant nutrients during dry periods when the moisture content of the topsoil is at or near the wilting point. Since nutrient absorption from a soil zone practically ceases as the soil dries to the wilting point, the placement of part of the fertilizer in the subsoil insures an adequate nutrient supply for longer periods during dry weather.

Several different methods of subsoiling and deep placement of fertilizer have been tried in different areas in the East. North Carolina State has tried mixing the topsoil and subsoil by using a giant disk plow that runs 20 to 30 inches deep. In the mixing process a large amount of lime and phosphorus was added to the soil. This deep plowing was field tested in 1960 with encouraging results. The results obtained would probably have been more striking had not the summer rains been so frequent.

In the Coastal Plains of Connecticut, a machine has been used which deep plows, subsoils, and applies fertilizer at the plow sole and subsoil depth all in one operation. This process is unique in that each furrow slice is subsoiled and fertilized.

Purdue University is using a giant chisel which reaches to a depth of about four feet and has 80 inch middles. Organic matter is blown into the opening made, and then into the soil at the rate of about two tons an acre. Residue from the previous crop is used for the organic matter. One very noticeable advantage of this system is that the amount of runoff is greatly reduced.

The State of Louisana has been performing some subsoiling experiments which are similar to that in this state. About a dozen subsoiling experiments were performed in the state of South Carolina last year. The results, for corn, cotton, and soybeans were favorable in some cases even though the rainfall during the growing season was sufficient.

Some land in the experiments was subsoiled to a depth of 18 inches. Other land was subsoiled and equal parts of superphosphate and dolomitic limestone were applied at the subsoil depth. The results obtained from most of these experiments were very encouraging.

Not all subsoiling experiments have been successful. In this state and in other sections of the country, crop response has been very poor on certain soil types and under certain conditions.

Most of the experimental work done prior to 1925 in several different locations across the country indicated that subsoiling was of little or no value. It is important to remember that prior to 1925 land was not in the state of cultivation it is today and that equipment used was relatively light.

Although subsoiling and deep placement of fertilizer has not proven beneficial in all cases, recent experimental work indicates that it may enter the program of many of our farmers in the near future.

A Real Peachy Beauty - The
Peach Queen of Lexington County

Pretty Girls, Peaches, Barbecue -- and Education??

Jim Ballington

Take a trip to Gilbert, the heart of the peach industry in Lexington County, South Carolina, next July 4th and see for yourself.

Early in 1959, in the community center at Gilbert, the idea of having a county-wide peach festival was born. This seemed a very appropriate idea since peaches bring in approximately one million dollars annually to the farmers of Lexington County. Likewise, a majority of the people in the Gilbert community either are peach growers or are connected in some way to the peach industry. The Community Club members decided to ask the peach growers of the county what they thought of the idea of having a peach festival. The growers response was overwhelmingly in favor of such a movement. A date was set for a joint meeting at which the two groups, the Community Club and the peach growers, decided to sponsor the festival on July 4th at the Gilbert School campus.

Preparations were begun at once by forming 23 committees to care for the numerous tasks which included publicity, program planning, food, and entertainment.

Pretty girls have always proved to be an excellent means of drawing a crowd, and the young lady adorning the preceeding page is evidence that the crowd was to be pleased. So to spotlight the entertainment, they decided to sponsor a contest to select the Peach Queen of Lexington County.

To provide an educational feature to the program a tour was organized which would include picking, washing, and packing the fruit for shipment. A fruit show and sale was sponsored to give the farmers a chance to show off their product. Many of the organized clubs over the county, as well as civic organizations, cooperated by putting displays in the Gilbert School gymnasium. Also, farm machinery companies and agricultural chemical manufacturers set up exhibits on the school campus.

Both the kind and amount of food proved to be no problem. Being held on July 4th and in Lexington County, the food was barbecue. Barbecue is a speciality in this county and the local people claim there is none better in the world than their own.

No public event today is complete without an address by some noted official in government, business, or education. Being a wide-awake group, provision was made for an outstanding speaker.

The whole-hearted cooperation of all local groups is needed for such an endeavor. Local school officials, Clemson College, the community and civic clubs, together with business people responded readily. Radio and TV provided the necessary publicity free of charge. More than 40 newspapers in and out of the state informed the public of the coming event.

The first peach festival proved successful and now the festival is an annual affair. The reason for success does not lie in an astounding new approach for attracting people, but simply that the public was given what it desired - good wholesome entertainment and an insight into one of the major industries of their home county. It all relates back to one of the foremost ideas behind education in agriculture today--namely, helping the farmer help himself.

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It is not wealth but tranquility and occupation which give happiness.

Thomas Jefferson

AG Students Initiate "Operation Contact"

Despite the ever growing demand for more people trained in Agriculture, enrollment in Schools of Agriculture has been declining during the last few years. Perhaps we in agriculture can assume some of the responsibility since we have been complacent. Too many of us have assumed the public was well aware of the far reaching changes in agriculture. All of a sudden we realized the farmer was no longer the national hero but a whipping boy. In addition, we soon saw that most people thought of agriculture as farming! To correct this erroneous impression, the Student Agricultural Council at Clemson decided to do its share.

"Operation Contact" is the program sponsored by the Clemson Student Agricultural Council to spread the "gospel" of agriculture to the college-bound high school students of South Carolina and surrounding states. The Council, in cooperation with the departmental clubs of the Clemson School of Agriculture, is seeking to send agricultural students from Clemson as emissaries to their home areas to talk with prospective college students about the opportunities for youth with interests in the modern agriculture.

In addition to the individual contacts, several Agriculture students have spoken to juniors and seniors in various high schools. Recently the Block and Bridle Club devoted part of the Little International Livestock show program to this subject. Two special programs are also presented during the State F.F.A. Convention.

Boyd Loadholt, Chairman, and Dr. Lowery H. Davis, Advisor, have written letters to each high school student contacted. Throughout the summer vacation period Clemson students will continue to urge home town youth to consider college training in agriculture. The hope grows that next autumn the faces of many eager Ag freshmen will dot the Clemson campus.

Jerry Moore talks with interested high schoolers about careers in Agriculture.

Hey! You had better not drink that!

Beware of Milk!?

Jerry L. Moore

Have you ever thought about the chances you are taking every time you drink a glass of milk? Do you realize that "cow's milk is not intended for human consumption, but only for calves"? That's what an extremely intelligent(?) friend of mine related to me recently. But I wonder - do you suppose he thought about the fact that no food is designed especially for human consumption except human milk? Actually nutrients or elements, not foods as such, are needed by man. My prejudiced opinion is that milk, while not a perfect food, is a "whale" of a food product considering its excellent collection of essential nutrients, its palatibility, and economic advantages.

I now refer you to some choice words of warning from an eminent(?) physician, R. D. Pope, M. D., in his book entitled Raw Vegetable Juices. "Cow's milk is probably the most mucous-forming food used by human beings. The casein (protein) content of cow's milk is exceedingly high, being 300% more than is contained in mother's milk." (Actually mother's milk has 1.5%, cow's milk 3.5% protein - a 300% difference.) "(Casein, by the way, is a milk by-product used as one of the most tenacious adhesive glues for glueing wood together.)"

He further asserts that all we have to do to cure colds, running noses, and tonsil, adenoid, and bronchial trouble is to drink nothing but raw vegetable juices such as carrot, cucumber, alfalfa, and dandelion juices - and stay away from that health menacing liquid, cow's milk. This really scares me, but after a swallow of the pint of mucous-forming liquid (milk) before me, I'll be able to write on.

And say - if milk doesn't make you deathly ill with its mucous-forming ability, "it will make a 'sissy' of you." Sure - "milk is a baby's food! Evidently milk was designed for infants and the very young." Still, I fail to see why I should search for other sources of calcium, high quality protein, riboflavin, Vitamin A and other nutrients when they are readily available in the palate-pleasing form of milk. I've yet to hear of an athlete or he-man being handicapped from drinking milk.

Then I've been warned by well-wishing friends in my weight watching efforts to stay clear of milk - "it's fattening." My skeptic brain starts turning and I soon conclude that no food can be properly called fattening or non-fattening. Except with glandular and metabolic problems, over-weight is caused from excessive eating of all foods, not from eating or drinking any one food. While almost all foods have calories, few foods can boast of the measure of nutrients per calorie that milk has. This seems to make milk a good dietary food - high nutrient content, which is needed, with a relatively low calorie content which is also desired for losing weight.

"Milk can cause heart attacks!" Even at my age, this scares me, and I'm tempted to ask "How long can I drink milk and expect to live?" Anyway it seems that a compound, cholesterol, contained in butterfat, animal fat, and some vegetable oils, has been connected to the occurrence of heart attacks caused by thickening of the arteries. It would seem feasible to prevent heart attacks by eliminating cholesterol containing compounds from the diet, except for the fact that the body makes a supply of cholesterol on its own so that animal fat or milk may not be the culprit causing heart attacks after all. The complicating influences of heredity, obesity, diabetes, hypertension and many other factors make it impossible to know the exact role of cholesterol in heart attacks. At any rate, any great change in the diet should be on the basis of a doctor's prescription, not on pseudo-medical advertising.

During all my school years, I've been told about the importance of calcium in the body for bone and teeth formation, clotting of blood, enzyme actuation, etc., and the importance of milk in obtaining the calcium requirements. Now, someone comes up with a report that "milk drinkers consume too much calcium". A check on the experiment shows that the report is based on a few illnesses caused by faulty metabolism, not by an excess of calcium, which is excreted from the body normally. Once again I can enjoy milk then, knowing that it is the only source of calcium which can supply the necessary amount without adding excess bulk to the stomach.

"Atomic Radiation - Beware! Milk is radioactive, containing Strontium 90 which has an affinity for calcium and causes bone cancer." Sounds as if we'd better begin to look for another, safer source of calcium, doesn't it? On the other hand, scientists have found that of the Strontium 90 a cow consumes, only 10% or less is found in the milk. It appears, then, that milk is safer for human consumption than plant foods which have been exposed to radiation, but not screened through the cow's body to make milk.

"Milk is full of chemical poisons and residues!" After so many charges against milk, I become irked by it all. Then, to this charge I ask one question. Is this accusation made due to ignorance or an intentional effort to mislead others? In days prior to chemicals, antibiotics, and sanitizers, illnesses, plagues, and deaths were frequent. Today, when chemicals are used to treat animal diseases, to exterminate pests, and preserve food, the death and illness rate due to poisons in food is completely nil compared to earlier illness and death tolls.

I wonder, finally, if the "natural food" faddists and addicts might like to return to the earlier age of superstition and false beliefs and ideas about foods rather than remain in our age of scientific food industries. They can have the earlier age! I feel much more secure in the care of food and nutrition scientists and scientific food processors. How about you?

1. Raw Vegetable Juices. Walker, N. W. and Pope, R. D. Norwalk Press, Phoenix, Arizona.

2. Other information from "Who Speaks for Milk", American Dairy Science Association.

Dr. Edwards Elected to AZ Membership

Dr. Robert C. Edwards has been elected to Centennial Honorary Membership in the Fraternity of Alpha Zeta by the Fraternity High Council and the South Carolina Chapter, located at Clemson College. Alpha Zeta is the national honorary and Service fraternity for agriculture.

Charlie Coble, Chancellor of the Alpha Zeta Chapter at Clemson, announced that Dr. Edwards was formally initiated into the Fraternity at the Chapter's annual banquet on April 30. Dr. Edwards was also the guest speaker for this event.

In presenting Dr. Edwards as a nominee for honorary membership, the South Carolina Chapter pointed out several of the highlights in his career. Graduating from Clemson in 1933 with a Bachelor of Science Degree in Textile Engineering, he became supervisor of the quality control laboratory at the Duncan Mill of J. P. Stevens & Comapny. Later, as a member of the Deering-Milliken organization, Dr. Edwards served as treasurer and general manager of the Abbeville Group of Milliken plants. Dr. Edwards came to Clemson as Vice-President for Development and became President of the College following the death of Dr. Robert F. Poole in 1958.

In his position as President of the State's land-grant school, Dr. Edwards has played an important part in the develment of an improved agriculture in South Carolina. Dr. Edwards has proven himself a friend of agriculture. He firmly believes that agriculture has a dynamic future in the nation's economy.

Hughes National Winner

Joe Hughes, Junior Animal Husbandry major from Duncan, S. C., has recently received confirmation of his winning a $100 scholarship offered by Alpha Zeta on a national level. Hughes, who is Scribe of the South Carolina chapter, was one of three winners chosen from 28 chapter-chosen applicants across the nation. The other two winners were from Idaho and Oregon.

Mr. Louis L. Madsen, Chairman of the Board of Trustees of Alpha Zeta, had special praise for Hughes' record which shows his unique ability to participate in many activities while maintaining top grades - a 4.0 G. P. R. for his last four semesters in fact.

Honors and awards are nothing out of the ordinary for Joe Hughes. He received numerous honors as a result of his active FFA work and served as National Vice-President in 1959-60. Since coming to Clemson, he has been a perennial participant and asset to Animal Husbandry Judging Teams.

In 1961, Hughes received the Alpha Zeta Award as the sophomore with the highest G. P. R. in the School of Agriculture. Even more recently, he was selected winner of a $500 scholarship awarded annually by the Ralston Purina Company.

Hughes will be the official delegate of the South Carolina Chapter of Alpha Zeta at the National Biennial Conclave to convene in Washington, D. C. in late summer.

New Boon to Forestry

Ted Blackwell, Forestry

Much has been written recently about the pros and cons of gibberellic acid and its effects as a growth stimulus on different species of forest trees. Many experiments are being conducted that will eventually prove whether or not this growth stimulant can be an economical addition to the complex business of growing trees.

If future experiments prove fruitful, there seems to be little doubt that gibberellic acid will be a boon to the forestry business. There may be a very particular advantage in the case of longleaf pine, (Pinus palustris). Longleaf pine remains in the so-called "grass" stage for a few years until stem elongation takes place. While it is in this seedling stage, it is very susceptible to Brown Spot Needle Blight caused by the fungus Scirrhia acicola which is very destructive to young longleaf pines. More rapid initial growth with the aid of gibberellic acid could possibly help to control this disease.

At the present time, the best way to get longleaf pine out of the "grass" stage is to keep Brown Spot from attacking the young seedlings by using various pesticides such as Bordeaux mixture, or by physical methods such as prescribed burning. Controlled burning destroys the conidia which are present on the lower needles of longleaf pine and on needles which have fallen to the ground.

By the use of gibberellic acid it may be possible to initiate rapid stem elongation which would allow the seedling to grow out of the "grass" stage more rapidly, thus increasing the distance between the conidia and possible rain splash. This, in itself, would save many thousands of seedlings and also shorten the time interval between establishment and harvesting of the crop.

What is gibberellic acid? It is a chemical that can stimulate a plant to grow and develop in many different ways. The natural source of gibberellic acid is an Asian fungus called Gibberella funjikuroi which is the fungus causing "bakanae", a disease threatening to eradicate the rice crop in China. The fungus was isolated and studied. It was noted that when the fungus was placed in a culture liquid, then removed and the culture liquid boiled, the resulting sterile liquid caused stem elongation in rice plants.

Soon forest research workers in the United States became interested in this finding and began conducting experiments of their own. The results of these trials indicated: (1) that even the lowest concentrations induced a change in some test plants; (2) almost every kind of plant treated with gibberellic acid responded; and (3) the most pronounced stem lengthening occurred on young actively growing plants.

According to Leake, it was possible to find favorable growth response on one month old Yellow birch seedlings using 100 parts per million gibberellic acid. Bilan and Kemp both found favorable response with 2 and 3% aqueous solutions of gibberellic acid on one year old loblolly seedlings.

Dr. R. D. Shipman of the Clemson Forestry Department recently conducted a limited test on 40 cuttings of a 3-year-old hybrid poplar (Populus deltoides x Populus nigra). The test pointed out that improved rooting took place only in a narrow range of gibberellic acid concentrations. The effect of the acid is borne out by the fact that only 40% of the untreated cuttings developed roots while 70% of those treated became rooted. This test revealed that gibberellic acid is adopted for use on certain hardwood cuttings.

In addition to the previously mentioned possibilities for use on longleaf pine to overcome Brown Spot disease, it may be used to (1) advance growth of a crop that must be harvested in a shorter period of time; and (2) overcome the scarcity of seed supply for certain plants.

How far has gibberellic acid advanced

in practical use? In forestry, gibberellic acid is still in the experimental stages. How can it be obtained? It usually is stocked in stores carrying garden supplies.

There are certain precautions to be observed in the use of this chemical: (1) overdosage may be detrimental to the plant; (2) the young plants may need time to establish roots before applying gibberellic acid except in the case of rooting certain hardwoods; and (3) gibberellic acid should not be expected to be a substitute for plant nutrients, sunlight, moisture, and other factors necessary for plant growth.

In all cases, the manufacturer's directions regarding the use of gibberellic acid should be observed.

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The future that we study and plan for begins today. Chester O. Fischer.

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A man is relieved when he has put his heart into his work and done his best. Emerson.

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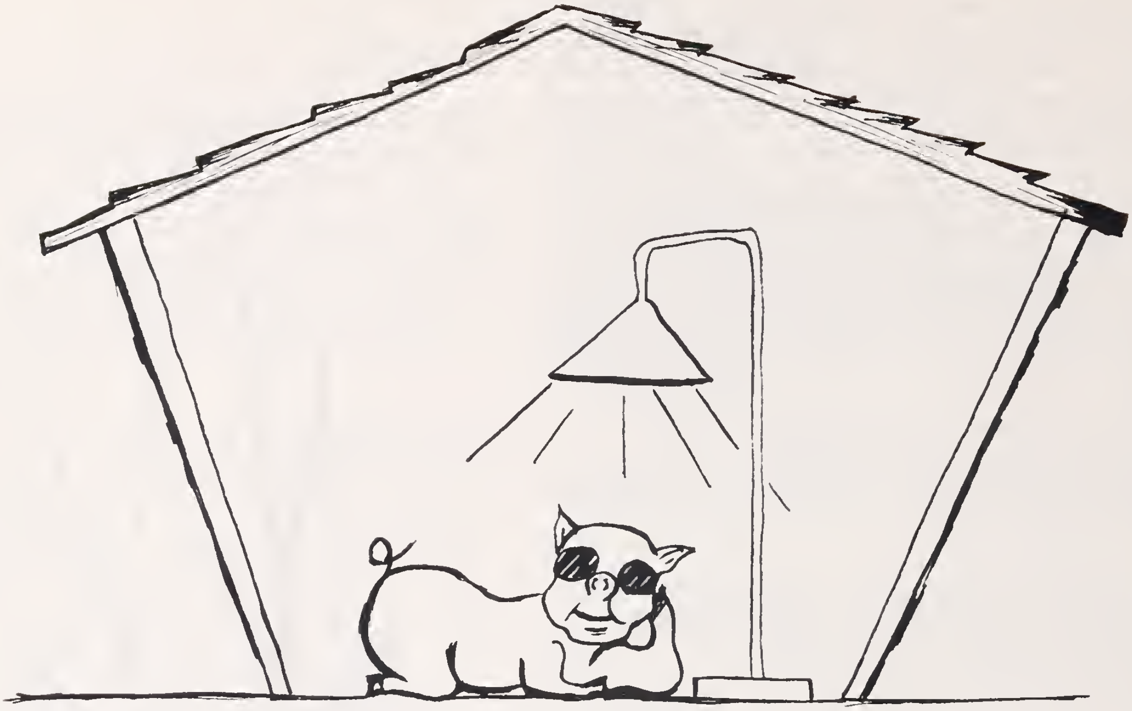
Nothing in haste but catching fleas.



Profits From Pigs

Bill Johnston

Farmers can make a profit with low capital investments in the Southeast. This is a pork deficient area and the production of feeder pigs offers a real opportunity. This article outlines a sound feeder pig production schedule, that if followed closely, will guarantee extra income.

There are two stages in the production of market hogs. The first stage is the feeder pig stage. These pigs are raised by the sow until they are weaned. The pigs then go in a second stage which is called the growing and finishing stage. If you have a limited amount of grain, but leisure time, raise feeder pigs. The time to start is now. Below is the estimated cost and returns of a twelve brood sow operation.

Sales:

Feeder pigs, 180 at 40 lbs. ($11.50 each)	$2,000.00
Sows, 6 at 450 lbs. ($12.00 cwt.)	324.00
Total receipts	$2,324.00

Variable Expenses:

Corn, 46 bu./sow and pigs, 20 bu./boar. 8.5 bu./gilt=Total of 613 bu. at $1.25	$ 716.25
Protein supplement 400 lb./sow, 365 lb./boar. 50 lb./gilt, 5 lb./pig = Total of 6,200 lb. at $4.80 cwt.	297.60
Ladino pasture 1.7 acres/12 sows at $25.00/acre	43.50
Boar cost (difference between sales and purchase price)	30.00
Vaccination for cholera, 180 pigs, .85/pig	153.00
Medical and other expenses	68.75
Marketing cost, 3% of total receipts	69.75
Total variable expenses	$1,378.85
Income over variable expenses	$ 945.15

Annual Fixed Cost:

Depreciation on 12 year average	210.50
Average interest (3% on $2,526) figured at rate of 6% on unpaid balance	75.78
Taxes and insurance	35.00

Total yearly fixed cost-------- $321.28
Net returns to land, labor and management--------------------------- $632.87

These figures are all estimates and perhaps could be cut by efficient planning and management. They are based on the following factors: (1) each sow farrows twice a year and raises 15 pigs (2) corn is figured at $1.25/bu. (3) pigs sold at $11.50 (4) six gilts held over as replacements (5) 1.7 acres of pasture is used.

The sows should be put into farrowing houses or pens prior to farrowing and given special attention at farrowing time. Three days after the pigs are born, they should be given iron shots, or allowed free access to soil or clay which is a good source of iron. This prevents anemia. They should also have their needle teeth cut shortly after birth. Their ears should be notched and their navel cord dipped in iodine. Artificial heat should be provided in the pen for the pigs to prevent chilling which might cause death. Most producers use 250 watt infrared heat lamps suspended about 30 inches over the pigs depending on the temperature. Castration of male pigs is recommended at the age of 3 to 4 weeks.

Creep feeding may begin when the pigs are about 3 weeks of age. Pig "pellets", preferably containing sugar, may be used as all baby pigs have a "sweet tooth".

Wean the pigs at 6 to 8 weeks of age and treat for worms and hog cholera. The pigs are now ready to be sold as feeder pigs. On a pound per pound basis, feeder pigs are worth about 1½ times as much as market hogs. Good feeder pigs will weigh from 40 to 100 pounds.

The feeder pig business has a definite place in the Southeast. The successful producer must have a well managed breeding and feeding program, however a small operation can be run efficiently during hours away from a regular job.

TOO MANY ON THE FARM
UNEMPLOYMENT 6%

....BUT WHERE DO THEY GO?

BETWEEN THE FURROWS

Agricultural Economics Club

Highlight of the year for the Clemson Agricultural Economics Club was an educational tour of farm-related businesses in the Atlanta area, April 1 and 2. The Club, accompanied by Dr. H. C. Spurlock and N. A. Wynn of the Research Staff, visited the facilities of the Atlanta Produce Market, the Cotton Producers Association, and several other major concerns. Included in the tour was a luncheon as guests of Swift and Company.

Another major event of the year, the Annual Banquet, will be held at the Clemson House on May 11. The entire Staff of the Department, teaching and research, the club members, and their wives or girl friends are invited to attend. Between 75 and 100 people are expected.

This summer, the Club hopes to send Jim Hite, rising senior from Kingsport, Tenn., as a delegate to the American Farm Economics Association Meeting in Storrs, Conn. Hite plans to enter the public speaking contest.

Agronomy Club

Club elections were held at the second meeting of the semester, February 19, 1962. Those elected were: John Meetze, President; John Connor, Vice-President; Hugh Gray, Treasurer; Jimmy Palmer, Corresponding Secretary; and and Boyd Graves, Recording Secretary.

Senior Supper, a supper honoring all seniors in the Agronomy Club, was held on May 1, 1962. The Club enjoyed an after-dinner lecture by a guest speaker.

Agricultural Engineering Club

The ASAE sponsored a field trip for its members on the first of March. The trip consisted of a tour of Hartwell Dam and its facilities near Hartwell, Georgia. The tour was guided by the resident engineer of the project which is being conducted by the U. S. Army Corps of Engineers and is designed for recreational facilities and electricity for civilian use. ASAE members were shown the engineering and construction aspects of the project.

An annual Georgia-Clemson ASAE Banquet is held with the Ag. Engineering Club at the University of Georgia. This year Clemson will sponsor the banquet on April 13. The students from Georgia will be given a tour of the Clemson campus during the afternoon and will attend the banquet in the evening.

Block and Bridle Club

The Clemson College Block and Bridle Club held its annual spring barbecue Saturday, April 14, at the Orange and White Intrasquad football game. The barbecue was served near the Field House from 12:00 Noon until 2:00 P. M. The price of $1.50 per plate, consisted of smoked barbecue, barbecue hash, rice, slaw, rolls, coffee and tea.

The Club held its annual Little International Livestock Show at Clemson on April 7, 1962. Morning activities got underway at 8:00 A. M. with a showmanship contest and a horse show at 11:00 A. M.

The afternoon activities consisted of a judging contest open to all 4-H and FFA members.

A banquet during the evening completed this busy day.

F. F. A.

Activities for the Clemson Collegiate F. F. A. Chapter since the preceding publication have included four regular meetings and work on several projects.

On November 14, 1961, Mr. Floyd Johnson, Agriculture teacher at York, S. C., and President of the National Agriculture Teachers Association, talked to the group on the qualities of a good agriculture teacher. His emphasis was on building strong character and leadership qualities. The December 12 meeting was fairly short with a film "Fallout in Agriculture". Miss Linda Colvin was named chapter sweetheart. The January meeting was dropped because of exams. Guest speaker for the February 13 meeting was Dr. G. H. Aull, Head of the Clemson Agricultural Economics Department. He gave a very interesting talk on the big business of agriculture. On March 13, 1962, new officers were elected: President, Charles Sparks; 1st Vice-President, Jimmy Ballington; 2nd Vice-President, Luther Waters; Treasurer, Gene Blackwell; Secretary, Benji Rhoad; Reporter, Gordon Chipicitis; Sentinal, Jackie Arnold. Their duties begin April 2, 1962.

The calendar committee has finished the calendar to be sent to high schools and advertisers. The yearbook is presently being prepared.

4-H Club

The 4-H Club members at their February meeting heard International Farm Youth Exchange delegate, Evan Varner, a 1961 Presbyterian College graduate, speak and show slides of his trip to Japan. Mr. Varner lived with the farm families of that country for approximately six months. The trip was awarded through the International Farm Youth Exchange Program sponsored by the South Carolina Master 4-H Club and the Agricultural Extension Service.

At the January meeting the club enjoyed its own Jerry Moore, junior dairy major from Anderson, showing his colorful slides on his trip to National 4-H Conference in Washington, D. C.

The Club undertook a new activity this year by sponsoring a "Mixer" at the Food Industry Building on January 6, 1962. Approximately fifty girls, representing Erskine College, Anderson Junior College, and Furman University, were present which resulted in a very successful and fairly profitable "mixer" for the Club.

After 5 years of very active work as advisor to the college 4-H Club, Mr. H. Oswell Vaigneur is resigning in order to pursue his graduate study at Iowa State University.

Mr. Vaigneur, a native South Carolinian from Ridgeland, obtained his B. S. in Agricultural Engineering in 1952, and his M. S. in 1959. He has served on the part-time teaching staff here at Clemson since 1960. His plans are to remain in the field of teaching and research after completing his graduate study.

Mr. Vaigneur's background of 4-H experience has caused him to be a very interested and effective leader and advisor. He attended Club Congress as member of the state champion Livestock Judging team member, and has served as President of the South Carolina Master 4-H Club. He comments, "It has been a privilege working with students in the college 4-H Club. By chance, maybe I have been able to return some of the many contributions afforded me through earlier activities in the 4-H Club."

To Mr. Vaigneur, the college 4-H Club offers hearty thanks and to him, his wife, Martha, and children, Keith and Annette, the very best of luck.

Horticulture Club

During February, ten delegates from the Clemson Club attended and participated in the 1962 Southern Regional Agricultural Workers Convention in Jacksonville, Florida. Highlights of the convention included tours and presentation of papers at the horticultural sessions. At the Collegiate Branch meeting of the American Society for Horticultural Science, Robert G. Halfacre of Clemson was elected president for this coming year.

James R. Cothran, a senior in Ornamental Horticulture, was the editor of the recently published Collegiate Newsletter. This Newsletter was distributed to the land grant institutions throughout the South. At present the Horticulture Club is engaged in making jelly and jam to provide funds for our annual banquet.

Dairy Club

Officers of the Student Chapter, American Dairy Science Association for 1962 were elected at the first regular meeting in January. Jerry Moore succeeds Jim Caughman as President while Jack Eaddy replaces Ken Butcher as Vice-President and Joe Barnette follows Jerry Moore as Secretary-Treasurer of the group.

The Dairy Club was represented by five delegates at the meeting of the Regional Student American Dairy Science Association held in Jacksonville, Fla., February 5-7. Those attending included Jim Caughman, past president and Regional President, who presided over most of the Convention meetings; Jerry Moore, new president; Larry Gause, elected delegate-at-large; Jack Eaddy; and Wallace Fraley along with club advisor, Dr. J. T. Lazar.

Activities in Jacksonville included hearing research papers presented by the parent organization ADSA, hearing about all the graduate schools in the Southeast from representatives of the respective dairy departments, and touring a Florida milk plant and producer farms.

Clemson is well represented on the roster of newly elected officers. Jerry Moore was elected 1st vice-president, Larry Gause-3rd vice-president, and Wallace Fraley-Secretary-Treasurer. Dr. Lazar was elected to a new 3-year term as Regional Advisor.

Six schools were represented including the University of Georgia, University of Florida, Mississippi State University, Virginia Polytechnic Institute, Auburn University, and Clemson College.

Current plans are for the Club to have representatives at the meeting of the National Association in Washington, June 18-22.

Mr. James K. Henderson, a 1955 graduate of Clemson and now Assistant General Sales Manager of Carnation Milk Company in Houston, Texas, spoke to the Dairy Club on February 20. He gave a very thought-provoking speech concerning the efficient utilization of time and the achievement of goals. (A synopsis of his speech appears in this issue of the Agrarian. Read it!) Mr. Henderson will also be well remembered by the many seniors he interviewed as prospective employees.

Some years ago, with the recognition of the growing importance of science in agriculture, Dairy Department Head, Prof. B. E. Goodale, began requesting permission to change the name of the department. The request has been granted and effective July 1, 1962, the Dairy Department will be officially called the Department of Dairy Science. With this change will come a change in the nomenclature of the staff. The teaching staff members will have titles of "Professor of Dairy Science", "Instructor of Dairy Science", etc. The research staff members will have respective titles of "Dairy Scientists". The Dairy Extension Service will be unaffected by the change, however.

Alpha Zeta Initiation

The honorary fraternity of Alpha Zeta held an informal initiation of six new members during the week of March 5-9. Those initiated were: Bill Simpson (Ornamental Horticulture, Iva, S. C.), Larry Vereen (Biology, Ocean Drive, S. C.), Tommy Gue (Ag. Education, Orangeburg, S. C.), Bo Shaw (Forestry, Sumter, S. C.), Richard Cooper and Jimmy Howard (both Fruit and Vegetable Horticulture, Clemson, S. C.).

Formal initiation followed on March 12. Attending the formal program were about 20 faculty members and 15 student members. The initiation was conducted by the present officers of the South Carolina Chapter, Chancellor Charlie Coble, Censor Ken Butcher, Scribe Joe Hughes, Treasurer Jim Cothran, and Chronicler Jerry Page.

* * * * * * * * * * * * *

She: "Don't you wish you were a barefoot boy again?"
He: "Not me lady, I work on a turkey farm."

* * * * * * * * * * * * *

"That's a pretty good looking car. What's the most you ever got out of it?"
"Nine times in three blocks!"

* * * * * * * * * * * * *

If ignorance is bliss, why aren't there more happy engineers?

"There are four requisites for a good short story," explained the English teacher, "Brevity, a reference to religion, association with royalty, and an illustration of modesty. Now I will give you thirty minutes to write a short story remembering what I have told you."

After 10 minutes Jim said he was finished and was told to read his story to the class. He read "'My Gawd,"said the countess, 'take your hand off my knee'."

The Little International

Miss Martha Hyatt of Cheraw, S. C., is shown with the lamb that helped her win the showmanship contest in the sheep division.

Miss Little International, Miss Brenda Watts of Thomason, Georgia, observes the showing skill of James Boling, Moore, S. C., which netted him the championship in swine showmanship.

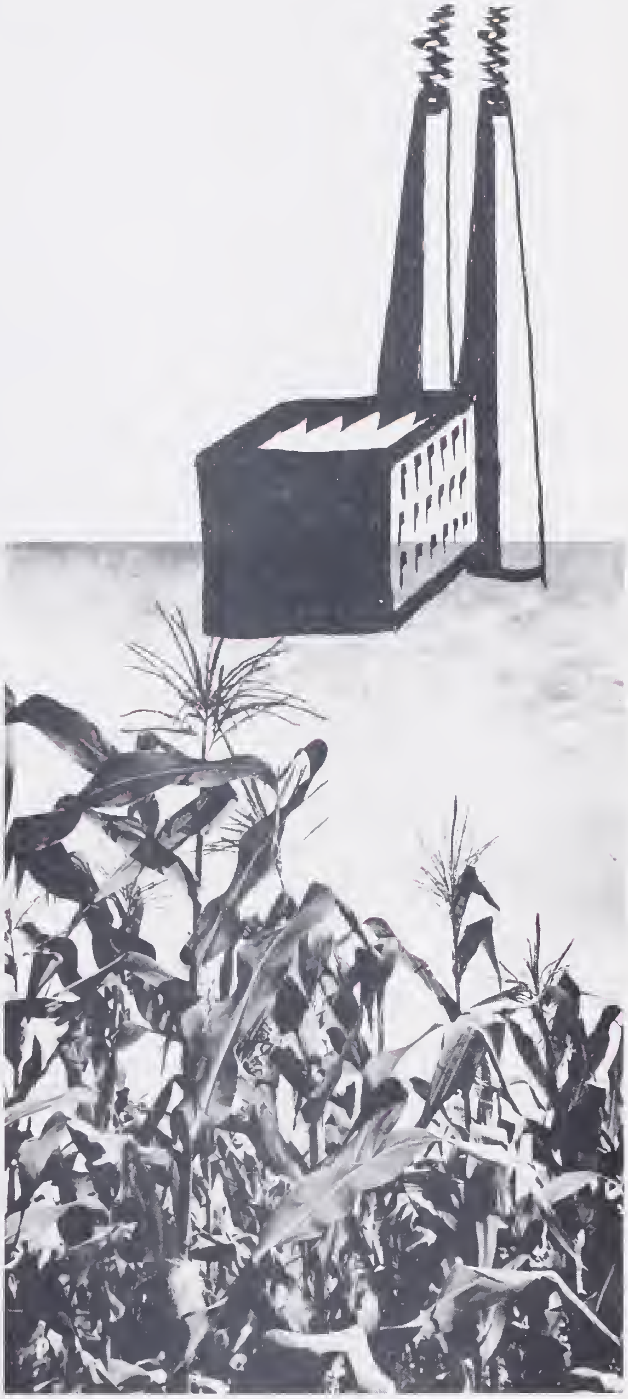
Bob Karney, of Covington, Tenn., poses the animal which he showed for the championship in cattle showmanship for the approval of Miss Little International.

Plant Factories

Jimmy Palmer

It has been said by some that a plant is the greatest factory on earth. The fact that a plant does manufacture its own food is a wonder of nature in itself - something never accomplished by man or his machines.

The first stage in the plant's life cycle is the embryonic stage. The embryo is the part of the seed that is to become a structure many times its own size. Therefore, this little embryo faces a tremendous task. First, the tiny embryonic plant must send roots down into the soil for minerals and at the same time force its way through the soil. Both difficult tasks must be performed with the aid of a small amount of food stored in the seed! This is expecting a lot from a little seed that is perhaps one, two or more inches below the soil surface. Such things as hardpans or hard surface crusts cause many embryonic plants to falter and fail.



Once the young plant emerges from the soil, many processes take over and the factory begins operation. The power is sunlight, instead of electricity. The resources needed to operate the factory are classified into two categories - those supplied by nature and those supplied by man. Those supplied by nature are air, the soil and its constituents, and water. The resources supplied by man include various elements and nutrients that the plant requires as well as others which are essential for plant growth.

The plant factory manufactures food needed by the plant during its lifetime while storing food in new seed for future reproduction and propagation. After the plant sets fruit and the seed reach maturity, the remainder of the cycle is up to man, who must harvest the seed and plant them the next growing season. Upon germination the new seed are ready to finally become plants and the plant factories will again be in operation.

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THE AGRARIAN

FEATURING:

STATE FAIR

The AGRARIAN

OFFICIAL STUDENT PUBLICATION, SCHOOL OF AGRICULTURE
THE CLEMSON AGRICULTURAL COLLEGE

FALL SEMESTER (December, 1962)

Clemson, South Carolina

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Nothing is more typical of early Autumn than the noise and excitement, the colorful displays, and the agricultural exhibits of a county or state fair. Nothing is more exciting for the young 4-H member or Future Farmer than preparing, training, and showing his prize animal. Never is there a better opportunity for agricultural producers to exchange ideas about "what can be done", nor a better time for the "city cousin" to view some of the best products of agriculture. In this, the fall edition of The Agrarian, we proudly salute the South Carolina State Fair and its contributions to the betterment of agriculture in our state.

THE AGRARIAN

This magazine is published twice yearly by the undergraduate agriculture students, and coordinated by The Agrarian Staff and the Student Agricultural Council. Opinions expressed in the magazine reflect solely the opinion of the author and do not necessarily reflect the policy of the School of Agriculture or Clemson College.

South Carolina State Fair

by
Feature Staff

A youngster, a lively hat, and a spinning, lighted ferris wheel: The 1962 State Fair had them all during its event-packed week in Columbia.

On Monday, October 22, 1962, The State Fair, South Carolina's spectacle of entertainment and education, opened in Columbia. This marked the ninety-third annual fair sponsored by the State Agricultural and Mechanical Society.

The present Agricultural and Mechanical Society of South Carolina was preceded by two similar organizations, The State Agricultural Society of South Carolina, from 1839 to 1849 and from 1855 to 1861. Six fairs were held by this second society from 1856 until

1861, after which the buildings and grounds were occupied by the Confederate authorities. The buildings were burned on February 17, 1865 by Sherman's Army. This, of course, ended the second Agricultural Society.

In 1869, the organization was reinstituted. It was dominated by the "Landed Gentry" and attempted to better agricultural conditions since agriculture was the backbone of this State's wealth. There was no Clemson College at that time, which is now so efficient in promoting all agricultural endeavors, to aid in promoting agriculture and its interests. Even from the beginning then, these societies fulfilled a real need.

Prior to the Civil War, the City of Columbia had conveyed to the Agricultural Society a tract of land in the northern part of the city for the purpose of holding an annual fair. A building, to be used by the Society, was erected on this tract of land by the City, and annual fairs were begun. In 1903 however, the fair and its attendance had outgrown the accomodations of those grounds and the fair had to be moved to new and larger quarters in 1904.

Use of the new and present site was initiated on October 25, 1904. This new site, containing 100 acres, was purchased at a cost of approximately $48,000 while the old site was sold for $30,000. Of the $48,000 spent, $33,000 was utilized in erecting buildings and making improvements. Annual profits were retired to provide for building a larger fair with increased and improved buildings and grounds. Approximatel $150,000 has been spent for new livestock exhibition buildings. The Society annually pays $20,000 in premiums for livestock and for appropriations for Winthrop and Clemson College exhibits. Premium offerings in field crops total $1,000 each year. No fair in the Southeast equals this offering.

The 1962 edition was no exception. Judging began the day the fair opened and continued throughout the week. Tuesday belonged to South Carolina's Young Future Farmers of America and Future Homemakers of America, opening with a giant rally in Carolina Stadium. Joe Hughes, Jr., Clemson senior in Animal Husbandry and Gene Merritt Clemson freshman in Dairy Science, were two of the major speakers at the rally.

In the State Fair Agricultural Department there was the appetite-whetting essence of new apples and the peep of fluffy chicks displayed as evidence of the many prime products of South Carolina. The apples were grown in Oconee County orchards and won $954 in premiums. The baby chicks were exhibited by the Clemson College Extension Service.

Prize beef cattle on display by South Carolina FFA members during the State Fair's Junior Beef Show.

Three communities over the state had displays in the agriculture exhibit with examples of community life and livelihood depicted in each. The communities exhibiting were the Rich Hill Community of Lancaster County, Mouzon Community of Williamsburg County, and Lake Murray Community of Lexington County.

No fair is complete without livestock exhibits. South Carolina 4-H Club and FFA members, producers, and out-of-state showmen filled this requirement for the State Fair in enviable style. Literally hundreds of young showmen pitted their skills, animals, and preparation in the swine, beef and dairy show competitions. The $16,000 prize purse did much to encourage these club members and producers to display their prize animals, for sure. The training a young person receives from participation in such an event warrants its continuation, not to speak of the pleasure and knowledge an observant spectator can glean.

This is part of the background and present status of the South Carolina State Fair, which attracted more than 250,000 people to its gates in October 1962. It was the greatest fair ever to be held in South Carolina and an excellent indication of both the agricultural progress that has been made, and of the expected future of agriculture in South Carolina. The State Fair has been of inestimable benefit to agriculture and its role in the economy of South Carolina.

For pleasure, for educational exhibits -- the STATE FAIR can't be beat.

The State's growing dairy industry was everywhere apparent at the 1962 State Fair. Left, a Guernsey exhibited by an aspiring young dairyman, is paraded before The Agrarian's cameras.

Field crops and vegetables on display at the Fair.

LIVESTOCK TEAMS ROVE

Every year the Block and Bridle Club sponsors a livestock judging team and a meats judging team that go on trips to several of our major cities for intercollegiate judging contests.

This year's livestock judging team is composed of Jan Lovell, Bill Johnston, Joe Hughes, James Boling and Claude Wheeler and is coached by Prof. Dale Handlin, Asst. Professor of Animal Husbandry. Thus far this group has competed in 3 intercollegiate livestock judging contests.

On September 19, they left for Memphis, Tenn., and the Mid-South Fair, stopping along the way at various farms and ranches to practice placing animals and giving reasons. One point of particular interest to the boys was the Circle M Ranch in Sinatoba, Miss., where they saw the world's highest priced Hereford bull. In Memphis, the team placed 4th in the hog division and took 10th place over all. Joe Hughes was 4th high individual in the hog division.

Two weeks later the team traveled to Atlanta where they competed in the Southeastern Intercollegiate Livestock Judging Contest. Here the boys turned in a "hot" first place over all in the sheep division with Jan Lovell being high individual in the sheep division. The team placed 5th over all in the contest.

While the rest of us were enjoying turkey at home on Thanksgiving, the Livestock Team along with the Meats Judging Team were on their way to Chicago to compete in the International Livestock Judging Contest. This contest, the "daddy" of them all, placed the teams in competition with some forty odd teams from all over the nation.

OUTSTANDING ALUMNUS

JOHN M. FLEMING, M.D.

by
Feature Staff

John M. Fleming, M. D., a graduate of Clemson College, has been selected as "Outstanding Alumnus" for this issue. He has had an outstanding and an inspiring medical career. The entire state is indebted to him for the many contributions he has made to the improved welfare of mankind.

Dr. Fleming was born on a farm in Laurens County, S. C., on September 5, 1904. During his early childhood, he enjoyed taking care of sick farm animals and pets. This may have had some bearing on his future profession. With his father, he also had first hand contact with both the joys and discomforts of farm life. He attended high school at the Spartan Academy and then entered Clemson College in 1922. While at Clemson he played guard on the Tiger football teams of 1923, 1924 and 1925. Dr. Fleming graduated from Clemson in 1926 with a B. S. degree in Agricultural Education.

After leaving Clemson, Dr. Fleming taught agriculture in Blacksburg for one year. He then entered the Medical College of South Carolina and graduated from that institution in 1931. His internship included one year at St. Francis Infirmary and one year at Walter Reed General Hospital. He did his residency practice at the Columbia Hospital for Women and at Garfield Memorial Hospital, both in Washington, D. C.

In 1934, Dr. Fleming returned to Spartanburg, South Carolina, and established a practice in obstetrics and gynecology, which he has maintained since that time. From 1942 until 1946 he interrupted his medical practice in order to serve with the U. S. Navy Medical Corps. He became a squadron surgeon and attained the rank of commander. His areas of service included the American Theater, the Alaskan Theater, and the South Pacific Theater.

By reviewing his records of achievements and contributions, it is easy to see that Dr. Fleming is devoted to his practice and to the medical profession. He holds memberships in the Spartanburg County Medical Scoiety, the South Carolina Medical Association, the American Medical Association, and the South Carolina Gynecology and Obstetrical Society. Dr. Fleming is also a founder member of the American College of Gynecology and Obstetrics. At the present, he is on the consultant staff at St. Luke's Hospital, Tryon, N. C., and is a staff member at the Greenville General Hospital, Greenville, S. C. He is Chief of the Obstetrics and Gynecology Service at the Spartanburg General Hospital. For many years Dr. Fleming has been known as "Mr. Cancer Fighter", in South Carolina. He received the South Carolina Division of the American Cancer Society's Citation for outstanding service in the field of cancer control for 1958. He is director and founder of the Spartanburg Cancer Clinic and a national director of the American Cancer Society.

In addition to his busy medical practice, Dr. Fleming finds time to take an active part in civic affairs. He is a member of the Kiwanis Club, the Alpha Kappa Kappa fraternity, Masons, and the Council for Spartanburg County. As a member of the board of directors of the Spartanburg County Foundation, Dr. Fleming has been instrumental in initiating countywide improvement projects and also in providing deserving high school graduates with college scholarships.

Dr. Fleming is married to the former Miss Carolina Miller. They have three children - James, Harriett, and John, Jr.

Dr. Fleming serves as an inspiration to all Clemson students who know him. He has shown that success can be attained if a man sets high goals and strives to reach those goals. His friendly handshake, warm smile, and his congenial personality are traits that mark him as a true Clemson man. The State of South Carolina and Clemson College are indeed proud of John M. Fleming, M. D., "Outstanding Alumnus."

FORESTRY DEPARTMENT ACCREDITED

On Wednesday, October 31, 1962, Dean Jack K. Williams announced that the Clemson College Department of Forestry had been accredited for professional education in forestry by the Council of the Society of American Foresters.

The Council, accreditation agency for all Professional Forestry Education in the United States, acted upon the recommendation of its Committee for the Advancement of Forestry Education, which visited the Clemson facilities during the month of October.

Clemson's approved standing joins South Carolina with five other southern states and 26 in the nation which have accredited forestry programs.

"Accreditation", said Dr. Koloman Lehotsky, Clemson forestry department head, "puts us on par with the other accredited schools in the United States. Our department will continue to promote the cause of forestry in South Carolina, which has nearly two-thirds of its land in forests. By educating our young people to take jobs in private forestry enterprises, as well as public enterprises, we are contributing to wise, professional management of the states' forests."

There are now 127 forestry majors enrolled in Clemson College. Forestry instruction began at Clemson, on a four-year basis in 1957, following a two-year curriculum which was started in 1946.

Dr. Lehotsky said accreditation calls for a faculty well qualified to carry out both teaching and research and indicates the presence of competent professors and research personnel.

"This new department," he said, "marks the beginning of future forestry activities at Clemson. Our first objective is to expand our research facilities, especially in wood utilization."

Dr. Koloman Lehotsky, Head
Clemson Department of Forestry

DAIRY INDUSTRY VENDS MILK

by
Julian Bradham

The dairy industry is constantly seeking ways to increase the consumption of milk - "natures most nearly perfect food." One method that has gathered momentum in recent years is selling through coin-operated vending machines.

The vending machine industry has grown slowly through the years with greater impetus since World War II. This year, 1962, marks its 76th anniversary in the United States. Records reveal that vending devices were used in Greece as early as 2000 years ago. Probably the first vending machine used in the United States was a ball gum vender. Gum, candy, and nuts were the main items sold through the machines in the early years of the industry.

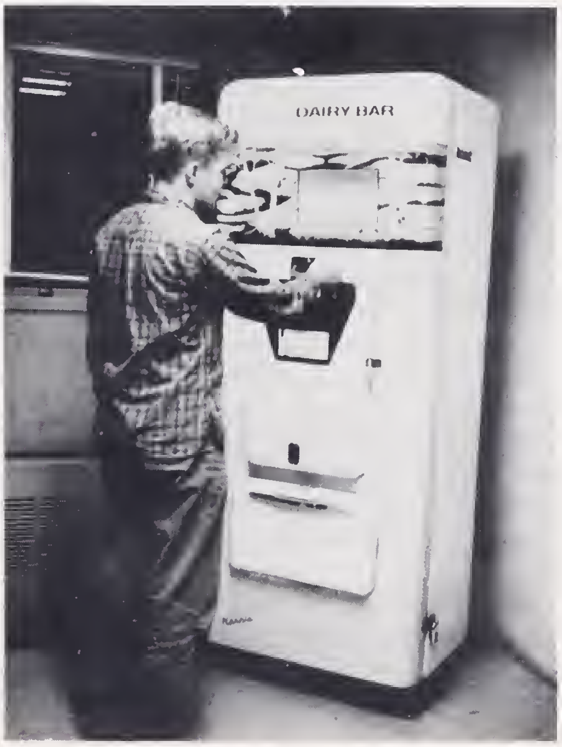
The development of small refrigeration units and their incorporation in vending machines made possible the merchandizing of soft drinks and later that of fluid milk. The sales of all vended items amounted to over 2.75 billion dollars in 1961, with milk and dairy products accounting for 100 million dollars.

The dairy industry has evaluated the use of venders and has located them in many market areas. The decision for locating a machine is based upon consumer convenience and the potential sales volume. Venders are installed in many places such as service stations, recreational areas, apartment houses, industrial plants, and "automated" restaurants.

Many different types of machines are in use. They are constructed for vending milk into paper cups and in all size containers, paper or glass. Some machines will vend cottage cheese, skim milk, cheese, ice cream and other processed dairy products.

The use of the vending machine has provided an additional method for advertising milk and dairy products. Persons buying dairy products through venders, especially those packaged in cartons, will usually remember the brand name when future purchases are made at the grocery store.

Vending machines, because of their great sales potential, will continue to be used for selling many items. The dairy industry will continue to increase the use of these "silent salesmen" for merchandizing dairy products.



BETWEEN THE FURROWS

Forestry Club

Late next spring, the Clemson Forestry Club will serve as host to the Sixth Annual Southeastern Forestry Conclave. This conclave will consist of a number of technical and skilled events such as Compass and Pacing, Pole Climbing, Bow Sawing, and D.B.H. Estimation. It will bring to the Clemson area, forestry students from all the southern forestry schools.... eleven schools in all ... members of the Association of Southern Forestry Clubs.

The Clemson Club is making a great effort to raise the necessary $2500 to make the 1963 Conclave the best ever.Principally, contributions and club activities such as cutting pulpwood, selling Christmas trees, and operation of the hat and coat check at school dances are being counted upon to raise the required funds.

The Conclave, lasting all day, will provide a most interesting spectacle of contests for observers. Prizes will be awarded to the individual winners and to the Club which amasses the greatest total points. The entire public is extended a special invitation to enjoy the show.

Membership in the Forestry Club is open to all students majoring in forestry, to extension and faculty foresters, and to research foresters in the state. The Club was organized in 1957 after Clemson began its four-year B. S. program in forestry and has approximately 100 members. Bow Shaw, Sumter, is president

Ag. Economics Club

The Ag Economics Club has held several car washes during the Autumn in order to raise money to supplement the income that it receives from the operation of a drink and a cigarette machine in the basement of Long Hall. This money will help finance a trip by the Club to a major southern city to tour Agri-Business institutions and help finance the publication of the club's annual newsletter.

At the first meeting, upperclassmen "adopted" the freshmen who have shown an interest in Agricultural Economics. The upperclassmen are to help the freshmen adjust to college life and, if possible, help them with studies.

An attractive Homecoming display constructed by the club showed a tiger shopping in a supermarket for Tarheels.

Forestry Club members as they hold a practice session for the Big Conclave coming in the Spring.

AMERICAN SOCIETY OF AGRICULTURAL ENGINEERS

The student branch of The American Society of Agricultural Engineers has begun the new school year with the leadership of their new adviser, Mr. J. T. Craig.

Homecoming visitors on campus and travelling the stadium road near the Agricultural Engineering Building, saw the attractive display erected by the active members of the society.

New initiates into the society probably would have chosen the old, now abolished, system of initiation, by paddling if they had been given a choice. Instead they have spent quite a few hours gathering corn from the fields of the Ravenel Farm to help the old members complete a successful money-raising project.

ALPHA ZETA

Joe Hughes attended the twenty-eighth Biennial Conclave of the Fraternity of Alpha Zeta. The sessions were held at the National 4-H Center, Washington, D. C., from September 10 through 13.

Joe, a senior in Animal Husbandry, attended along with delegates from each of the Fraternity's 51 other chapters in 47 states and Puerto Rico.

The South Carolina Chapter of Alpha Zeta conducted its formal initiation on November 5. Those initiated were: Jake Joye, Agricultural Engineering; Jimmy Palmer and Jimmy Carter, Agronomy; Larry White and Jim Trautner, Biology; Claude Wheeler, Animal Husbandry; and Joe W. Barnette, Dairy Science.

BLOCK AND BRIDLE CLUB

The Clemson College Block and Bridle Club held its annual fall Bar-B-Q at the Duke-Clemson Game on October 20. Each year the club sponsors a fall and a spring Bar-B-Q to finance the activities of the Block and Bridle Club. The primary activities of the Block and Bridle Club are to sponsor trips for the livestock and meats judging teams and to sponsor the Clemson College Little International livestock showmanship and judging contest.

DAIRY CLUB

The Clemson Chapter of the ADSA held its formal initiation on Tuesday night, October 23, in the Food Industries Building, Poole Agricultural Center. The ten initiates were required to furnish short papers on subjects relating to the dairy industry. They were quizzed by the old members and the members of the dairy staff present. Dr. W. H. Wiley, Dean of Agriculture, was special guest.

The dairy judging teams were sponsored again this year by the Clemson ADSA. The cattle judging team included Joe W. Barnett, S. Eugene Bennett, and Jerry L. Moore. Professor C. C. Brannon served as coach. Members of the Products Judging Team were John G. Eaddy, Larry A. Gause, Cedric L. Thomas, and Jon M. Rogers, Dr. J. J. Janzen served as team coach.

COLLEGE 4-H CLUB

A variety of activities highlighted the work of the Clemson 4-H Club during the past year. A mixer shortly after the Christmas holidays proved a large success to a sizable number of Clemson students who attended. In May, the club had a cook-out on Lake Hartwell with dancing afterwards in the dormitory lounge. Girls from nearby schools were invited.

During Farm and Home Week, the members were in action providing entertainment to the young people present. A refreshment stand, set up by the club as a fund-raising project, proved to be quite successful.

Plans are now being made for another mixer in a year that promises banner achievements for the Clemson Collegiate 4-H Club.

FOREIGN MARKETS FOR S.C. PEACHES

by
Norman O. Cox

Last summer, more than one hundred, 20-pound boxes of S. C. peaches were sent overseas in an attempt to find a new outlet for the ever increasing S. C. peach crop.

The peaches for this initial attempt to enter the European fruit market were supplied by Troy H. Cribb and Sons, of Spartanburg, S. C. For this purpose, Mr. Cribb diverted a partial load of peaches that had been picked for the New York market, packed them in special containers, and sent them on their way. Others assisting in this initial attempt were Mr. Jerold F. Pittman, Assistant Agricultural Economist, representing Clemson College and the State Agricultural Marketing Commission; Mr. Paul Quattlebaum, General Manager, U. S. Dept. of Commerce Field Office at Charleston; Mr. E. W. Brooks of the S. C. Farm Bureau Federation; the Varian International Trading Corporation, Charleston; and the S. C. State Development Board.

There were actually three shipments - one to England, one to Denmark, and a third one to Holland. These went by truck to N. Y. where they were placed aboard a ship. The shipment to England was loaded on the Queen Elizabeth and arrived 4 or 5 days later. There the peaches ran into stiff competition from Italian peaches. In addition they arrived at the peak of the English soft fruit season. Even so, acceptance of the samples, particularly in the Netherlands, has been more successful than had been hoped. Word has been received from T. Walten Ltd., London Fruit and Vegetable Merchants and Distributors, suggesting that another attempt be made next year, perhaps during an earlier season. This company wants to handle S. C. peaches on a commission basis next year.

The shipment to Holland was sent by regular freighter. These peaches were about 12 days en route but arrived in good condition. This shipment also was in competition with the Italian and French peaches, but with European fruit selling for about 21 cents per pound, it is believed that our peaches can be delivered and sold competitively with this price. The Dutch distributor, Mr. H. F. H. M. Smelt of Continental Fruit Company, Rotterdam, has already requested more peaches for next season, but has suggested shipments of fruit more highly colored than the Elberta. These would include such varities as the Dixie Red and the Red Haven.

On the basis of his experience this year, Mr. Pittman believes that we will be able to compete with European producers but says that a few "bugs" will have to be ironed out first. If we could ship directly from Charleston instead of

New York, we could save on both travel time and transportation charges. This, in itself, would allow us to compete more favorably with European peach producers in the English market. Other ways to reduce shipping cost would be to send larger shipments and to shop around for cheaper trans-Atlantic merchant vessels.

One result of this experiment of shipping peaches to Europe, occurred when a Holland firm sent a representative to talk with Gov. E. F. Hollings on his recent trip to Europe. Their talk concerned the possibility of buying approximately ten percent of the South Carolina peach crop.

This attempt to sell South Carolina peaches is but a small phase in the constant search for new markets for South Carolina produce, which is being made by agricultural leaders in South Carolina.

A representative of the Dutch food industry and the American Farm Bureau's Rotterdam agent look over a shipment of South Carolina peaches.

CLEMSON AGGIES STALK THE LAND

by
James A. Boling

Each day Clemson agricultural students are achieving goals that bring Clemson College to the eyes of the public. Throughout the state and nation, the name of Clemson rings in the ears of those who have come in contact with these gentlemen. As we look back into the past few months, we find that many Clemson students have achieved goals that have lifted high the name of our instutution.

Gordon Halfacre, President of the Clemson College Horticulture Club and the Southern Regional Collegiate Branch, attended the American Institute of Biological Sciences at Oregon State University in Corvallis, Oregon. Halfacre was elected President of the Collegiate section of the National Society, and was awarded third prize for his paper, "Orchids at Clemson".

Jim Hite, an Agricultural Economics senior, attended the American Farm Economics Association meeting in Storrs, Connecticut. For his speech on "Southern Rural Poverty", Hite was awarded second place in the National Public Speaking Contest. He was also elected Secretary-Treasurer of the Student Section of AFEA.

Gene Blackwell, a senior in Agricultural Education, attended and participated in the National Convention of Alpha Tau Alpha in Kansas City. Blackwell represented the South Carolina chapter which is very active on the Clemson Campus.

Joe H. Hughes attended the 28th Biennial Conclave of the Fraternity of Alpha Zeta at the National 4-H Center in Washington, D. C. Hughes represented the South Carolina Chapter at Clemson where he is a senior in Animal Husbandry. Delegates from each of the fraternity's 52 chapters in 47 states and Puerto Rica participated in the conclave.

Alpha Zeta fraternity members are selected on the basis of their high scholarship, fine character, and potential leadership. Over 42,000 men have been initiated into the fraternity since its founding over 65 years ago.

Hughes also received the "top cadet" award at the Army ROTC Training Program at Fort Bragg, North Carolina.

The Clemson College Livestock Judging Team, composed of James Boling, Joe Hughes, Bill Johnston, Jan Lovell, and Claude Wheeler, placed fifth in overall and first in sheep judging in the Southeastern Livestock Judging Contest held in Atlanta. The team, coached by Professor Dale Handlin, was also fourth in swine juding at the Southern Intercollegiate Livestock Judging Contest which was held in connection with the Mid-South Fair at Memphis, Tennessee.

The month of July found Dairy Major Jerry Moore journeying toward St. Louis for a two week visit along with 36 other Ag. seniors from over the United States and Canada - all guests of Ralston-Purina Company. This fellowship program is an annual award designed to help Ag. seniors obtain a broader view of agricultural industry. Two weeks later Moore moved on up to Michigan to meet with Clemson's outstanding freshman, Charles Ables, Ag. Engineering Major, at the American Youth Foundation Christian leadership training camp in the beautiful sand dune country of the Lake Michigan shore.

The Clemson College Dairy Cattle Judging Team, coached by Prof.C.C.Brannon, was composed of Joe W. Barnette, Eugene Bennett, and Jerry L. Moore. On their judging trip, they visited Iowa State University, The University of Missouri, Calumet Farms in Lexington, Ky., and the Purina Research Farm in Gray Summit, Missouri. The team placed fifth over all and second in Guernseys at the Mid-South Fair in Memphis, Tenn. At the National Dairy Cattle Congress in Waterloo, Iowa, the Clemson team placed first in Guernseys and eleventh overall. Jerry L. Moore was high individual in judging Guernseys.

In June, Jimmy Williams represented Clemson's Dairy Club at the national meeting of the Student Affiliate Branch of The American Dairy Science Association. The three day meeting convened June 18 at the University of Maryland, College Park. Jimmy reports a pleasant and gainful experience that will serve well toward promoting local club activities.

Congratulations to each man who has so faithfully and honorably represented the name of Clemson College.

The Clemson Dairy Cattle Judging Team with Miss Helen Walker, Tennessee State Dairy Princess, at the Mid-South Fair, Memphis.

A SUMMER WITH DANFORTH

ED'S. NOTE:

Annually Ralston-Purina Company sponsors summer fellowships for the "Outstanding Agricultural Senior", the "Outstanding Agricultural Freshman" and similar awards for Home Economics Majors in colleges throughout the United States, Canada, and Puerto Rica. These awards, given in the name of the Company's founder Mr. William H. Danforth, offer the seniors a two week stay in St. Louis and a two week experience at the American Youth Foundation Camp, Stoney Lake, Michigan. The freshmen are offered a scholarship to the two week leadership training camp. The following is a report from the 1962 Danforth Ag. Senior, Jerry L. Moore. Charles Ables represented Clemson in the Danforth Freshman Program while Miss Mary Sue Baker, York and Winthrop College, was South Carolina's Home Economic's Senior in the Fellowship Program.

When one feels that he has had the most rewarding experience of his lifetime thus far, how can he write to adequately tell others about his good fortune and eye-opening experiences? This is my problem. The experience to which I refer is the Ralston-Purina Summer Fellowship, offered annually in the name of the Company's founder, Mr. William H. Danforth, to an agricultural senior in each agricultural college in the United States, Puerto Rico, and Canada. This summer it was my privilege to be one of the 37 lucky "Ag. Seniors" from over the country to receive this award. We spent an extravagant but challenging two weeks in St. Louis and a challenging and inspiring two weeks in a Christian leadership training camp on Lake Michigan as guests of Ralston-Purina Company.

I suppose the customary method for presenting such a story is to present somewhat of a travelogue of the trip. I prefer, however, to discuss the fellowship in a general and deeper sense. Thus I will not rob the junior who will go next year of the thrill of unknown detail and excitement the trip offers.

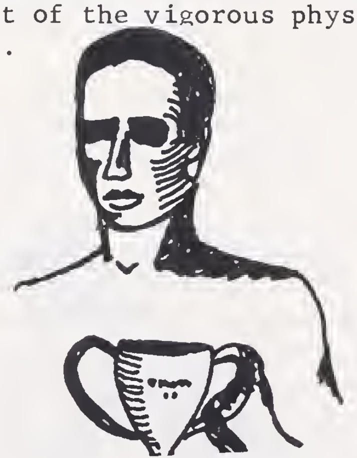
Let's get this perfectly straight first. Though the four-week fellowship is all-expense paid by Ralston, it is not a proselytizing adventure to gain employees. It is a serious, generation-old effort, begun by Mr. Danforth, to help students make decisions, enlarge their vocational horizon, broaden their contacts, and receive training in the four-fold development---physical, mental, social, and religious development.

The two-week stay in St. Louis offered many "firsts" for all of us. We saw facilities of the company's private research and heard Purina employees tell of their experimental projects in the lab and on the farm. We saw the evident happiness of people engaged in work they enjoy, employed by a company that not only believes in and encourages high ideals, but one which uses such practices as this annual fellowship program to help young people establish ideals and make decisions of honor for the future.

During the two weeks, we toured a large aircraft plant, a large chemical company, an advertising agency, a hospital and medical school, a seed processing company and a federal bank. At each of these places lectures were given to help acquaint us with that field or phase of business and with the philosophy of these particular companies. This was their effort to help us broaden our scope of general knowledge and help prevent our becoming so narrow as to be almost unable to converse with people in other fields of business and interest.

Of course, pleasure was a part of the program - musicals and plays at the St. Louis Municipal Opera, major league ballgames in Busch Stadium, our own softball games, numerous luncheons and banquets, along with our "free nights" on the town caused memories we will never forget.

The two weeks at Camp Miniwanca - with its frontier-type living and very different from the easy living in St. Louis - provided us with some of the most thought-provoking and challenging ideas we had ever faced. Morning classes in ethics and religious development, a daily talk by some very prominent person on what he considered to be "life's essentials" were part of the regular schedule. These talks and the examples displayed by the speakers shamed us for the small development of our abilities, but also challenged us to the fullest development and exploitation of our abilities and talents. Daily softball and volleyball games, water and track meets, plus physical training and a daily 6:30 a. m. dip in the 48° water of Lake Michigan were part of the vigorous physical training.



Now what is the significance of this type of training and fellowship? Have you ever really thought about your life philosophy concerning social, religious, physical, and mental growth? Is each phase of development up to par? Are they in balance? This was the underlying theme to all our activities - growth and development in a balanced four-fold way. Can you accept Mr. Danforth's challenge to "stand tall" - develop physically; "think tall" - develop mentally; "smile tall" - develop socially; and "live tall" - develop spiritually? Consider these things. They will have a direct influence on your future. Once we begin living up to these challenges, we too can take Mr. Danforth's motto as our own and be proud "to be my own self at my very best all the time."

THE SMALL GRAIN STORY

by
Jimmy Palmer

When you read or hear that a new variety of small grain has been released, do you realize what the development of the variety has entailed? Actually the process is a long and rather complicated one.

Let us assume that a small grain breeder wanted to develop a new variety of oats, starting from "scratch" in 1963. This first year, he would select two varieties, each having different desirable characteristics that the breeder would like to have in one variety. He would proceed to cross the two varieties and save the seed produced.

The following year, 1964, the 1963 seed would be planted to produce the F_1 generation, which would be genotypically alike.

In 1965, the seed from the F_1 plants would be planted to give the F_2 generation in which there would be a "sorting out" or segregation for types. From these plants, the breeder would select and harvest plants according to disease resistance, rate of maturity, height, and other phenotypic characteristics.

In 1966, one row would be grown from each one of these selected F_2 generation plants, the result being, the F_3 generation. Among the F_3 plants, the breeder would make selections among individual rows and among individual plants. This means that many rows will probably be discarded.

In 1967, there would simply be a repeat of the production, selection, and harvesting of seed--this time the F_4 generation seed.

In 1968, the breeder would select and cut from the F_5 generation those rows which are uniform and desirable for disease resistance, height, maturity, etc. These would be entered in preliminary yield tests in 1969. Non-uniform rows can be reselected for further observation.

The process of yield trials would continue in 1970 and 1971 with the best selections being planted in state-wide yield tests.

In 1972, state yield tests would continue and the commercial production of pure seed, Breeders seed would be initiated in this the tenth year.

In 1973, preliminary seed increase would be started on the most promising selection or selections with the production of Foundation Seed.

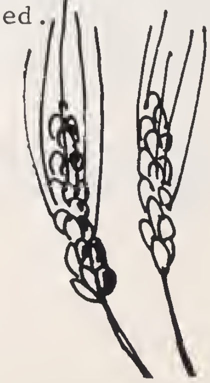
The next year, 1974, would be spent increasing the pure seed stock to Registered Seed, while yield tests would be continued.

In 1975, after thirteen years of extensive yield and performance tests, the strain may be named and released to certified seed growers if the strains performance exceeds the standards of currently recommended varieties.

After fourteen years-1976-Certified Seed would be available for the farmer to plant.

It is generally agreed that fourteen years is a minimum time for the production of a small grain variety. However, the Sumter Oat, developed and released recently by Clemson, required only nine years due to the fact that occasionally two generations were produced in one year. This was done by producing one generation in South Carolina in the winter and another in Idaho during the summer.

After the new variety has been released and is being grown by the farmers, a continuous supply of Breeder Seed is provided (in South Carolina) for the South Carolina Foundation Seed Organization, for continued production of Foundation and Registered Seed.



A FRESHMAN CATCHES HIS BREATH

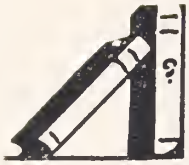
by
Thomas O. Milliken

The bell rang ending my fourth period class. "Whew! I'm glad today's classes are over!" Though I look forward to resting in the afternoon, I realize that I have a great deal of studying to do, which was something I rarely did in high school. I look back to those days often--the games, the dances, the leisure time. So often I wasted time, having no responsibility and no great problems. All of this has changed. Now I'm my own boss, investing my time wisely or spending it foolishly. If I make a mistake now, I have to answer to the consequences myself. Sure, Mom and Dad will stick by me, but they are not here at the moment of decision. They won't be in my room to prod me into studying. This is something I must do myself.

Graduation from high school was a big thrill, but minor to that I felt on entering Clemson. After being here only a few weeks, I realized the importance of a good academic background in high school. I realize now that the advice given to me by my counselors and by my parents was meant to help, not punish me. It was not until I tried to make the adjustment to college life that I realized this.

The first semester of the freshman year is considered to be the hardest, as it's not only adjustment to your school work, but to the new environment as well that influences your outcome. There are so many new and different challenges awaiting that confusion hinders accomplishment. For the first time, I find myself realizing the task ahead of me. Changing my high school attitude to meet college demands will be necessary for success at Clemson, I am sure. Many pleasures will have to take second place as I begin trying to "put first things first."

I find I have acquired a sixth sense, which is the sense of balance. I have discovered that this sense is the most important sense to a college freshman. Whether he wastes his time and money doing nothing or invests them prudently for the future is his decision. The old men have the wisdom, but the freshmen and youth have the imagination. If these two characteristics could be combined, this combination would prove to be the unbeatable power in the conquest of the mind's worst enemy--indolence.



AGRARIAN PHILOSOPHY

By
The Editor

In the spring of 1962, the Student Agricultural Council began a program called "Operation Contact." The purpose of the program was to encourage Clemson students to contact high school students concerning their plans for college study.

Enrollment has decreased in the School of Agriculture rather steadily in recent years. What has been the cause for this? In our contact with high school students and college undergraduates it seems evident that agriculture is presented publicly as being outdated, as offering few jobs except those involving only manual labor and low salaries, and as being related only to production on the farm itself. True, the need for numbers of farmers is decreasing, although there will always be room and success for the well-trained ambitious individual who desires to farm. This is only half the story. Agriculture now encompasses many of the industries formerly thought to have little relation to farming. The fellow who is interested in engineering is needed in Agriculture. The fellow or gal with a yen for chemistry, for journalism, public service, or business administration all have important places in the great Agricultural complex. This is our hope--to present a true picture of Agriculture today--to show that it is a field of work encompassing almost all fields of specialized interests.

What about it, Ag. students? Will you help us present a true picture of the "new challenge in Agriculture?" We aren't asking for recruits. We ask only that students be able to see Agriculture in its true prospective before making their choice of a major field of study. Only if the student is convinced of his choice can he give or receive benefit from his work and study.

What about it High School Student? Do you think that Agriculture involves nothing more than daily manure shoveling or "dirt farming" and daily drudgery? If so, request more information; the snap decision you have made is wrong. Regardless of your interests, Agriculture has a place for you. Think it over and be sure, before you make a choice! If you have an Agricultural background and an interest in related fields--science, business, production--your place is carved into the industry if you will utilize it.

High School Guidance Counselors, principals, and teachers, will you give us a chance to present the "new challenge in Agriculture" to any group in your school? Perhaps such a presentation will aid some student in choosing the right field of study and will prevent the disillusionment often found in students studying according to "Dad's desires" only or according to unreasoned decisions.

TALL CORN

A man was perched atop one of Atlanta's highest buildings contemplating suicide. A policeman had made his way to the roof to try to persuade the man not to jump. "Think of your mother and father," pleaded the officer.

"Haven't any."

"Think of your wife and children."

"Haven't any."

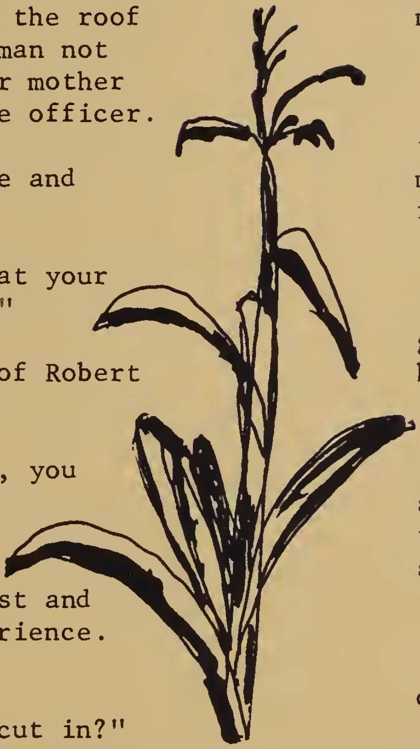
"Well, think of what your girlfriend might think."

"I hate women."

"All right, think of Robert E. Lee."

"Who's he?"

"Go ahead and jump, you Damn Yankee."



Two rabbits got lost and had a hare-raising experience.

"Pardon me, may I cut in?" asked the young surgeon as the operation began.

Milk, cream, and butter- you can't have one without the udder.

Marriage is like sitting in a bathtub - after you get used to it, it ain't so hot.

Then there was the dairyman who fenced in his house and yard so his cows could moo the lawn.

Ad in English newspaper: "Owner of tractor wishes to correspond with widow who owns a modern thresher; object matrimony; send photograph of machine.

One skeleton to another as they were climbing a steep mountain: 'Let's sit down and rest our bones."

Wine, Women and song are getting me down; I reckon I'll have to quit singing.

The weaker sex is the stronger sex because of the weakness of the stronger sex for the weaker sex.

Farmer: "And this is the cider press, Ma'am."

City Visitor: "How interesting! And when do you run off the next edition."

Mortician to reporter: "Yes, my whole business burned to the ground. But fortunately not a soul was hurt."

Moe: "So you graduated from Barber's College? What was your college yell?"

Joe: "Cut his lip, rip his jaw, leave his face, raw! raw! raw!

This Fall Semester, 1962, issue of THE AGRARIAN is sponsored by

CLEMSON STUDENT AGRICULTURAL COUNCIL

In behalf of all agriculture-related clubs on the Clemson campus, The staff of THE AGRARIAN wishes to express its gratitude to the Agricultural Council and to each campus organization contributing to the Council's fund.

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DUPLICATE

THE AGRARIAN

''25 YEARS WITH

SOUTHERN AGRICULTURE''

''SPRING, 1963''

The AGRARIAN

OFFICIAL STUDENT PUBLICATION, SCHOOL OF AGRICULTURE
THE CLEMSON AGRICULTURAL COLLEGE

Clemson, South Carolina

SPRING SEMESTER (April, 1963)

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THE AGRARIAN

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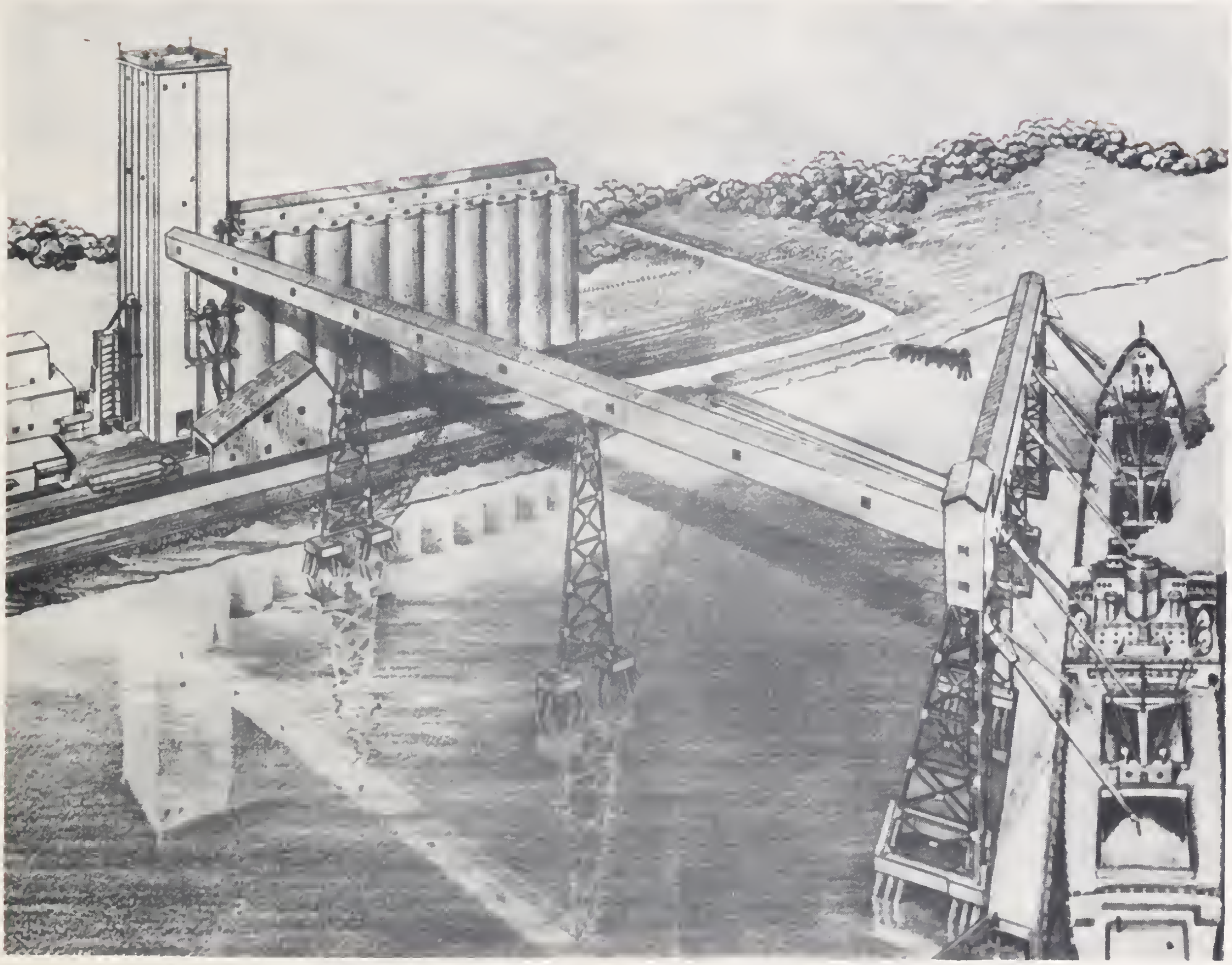
NEW MARKETS ABROAD

by

Jimmy Williams



The above photograph shows a steamer taking on a load of grain at the State Ports Authority Grain and Soybean Storage and Export Facility near Charleston. This modern facility has a total capacity of 640,000 bushels.

The Agrarian staff would like to thank Mr. Tom Warren, Information Director, S. C. Farm Bureau Federation, for the information used in this article.

Sixteen months ago, December 1961, a group of South Carolina farmers met in Columbia. No one realized at that time that out of this meeting would grow an organization of farmers which would be shipping grain and fresh fruits to Europe, and adding more than $2 million to the farmers' income in 1963.

The group of farmers was the board of directors of South Carolina Farm Bureau. The organization they instituted was the S. C. Farm Bureau Marketing Association.

One of the first projects of the newly created farmer controlled Marketing Association was the operation of the state's new $2.8 million grain export facility at Charleston. The Association was able to get the management contract after farmers throughout the state invested $150,000 as initial operating capital for the facility. Farmer investments in the facility now have grown well over $200,000.

A ship called at Charleston early in February and wrote a new page in South Carolina agricultural history and put state farmers in the export business. It loaded some 300,000 bushels of soybeans produced by South Carolina farmers, purchased by South Carolina farmers and sold for export by South Carolina farmers. This shipment also put the Port of Charleston back into the grain export business - a business untouched in over 100 years.

The money farmers invested is now working for them in two ways. First the investment is bringing in a five percent interest, and secondly, by helping operate a farmer-controlled buying station for grain, farmers are receiving a substantially higher price for their crop.

David H. Sloan, Jr., president of both South Carolina Farm Bureau and S. C. Farm Bureau Marketing Association, said recently: "For the first time in history, soybeans are worth more at Charleston, sub-terminal and country points in South Carolina than in Chicago, the world's largest grain market, and prime points in downstate Illinois."

The price paid to producers for soybeans in South Carolina during the harvesting and marketing season this year has reflected as much as 62 cents per bushel over the government support price. Prior to 1962 farmers could expect to receive a price slightly above support levels during this period. Also, state farmers were unable to take advantage of the export market for soybeans without paying a high transportation cost to the nearest export facility - Norfolk, Virginia.

There may be several factors which have contributed to the price structure change for soybeans in South Carolina, but to the largest majority of the producers who have received this increased income, the number one factor is the "Farm Bureau Elevator" in Charleston.

On the state's crop of about 12,000,000 bushels of soybeans, the total gain in farm income will be approximately equal to the total cost of the $2.8 million facility completed last year by the South Carolina State Ports Authority. The Ports Authority had constructed the 640,000 bushel elevator at Charleston under a mandate from the legislature "to provide an export facility for soybeans and other small grains."

Mr. Sloan said the Ports Authority and the state legislature have performed a vital service to state agriculture in building the facility. In addition to higher incomes, S. C. farmers can anticipate planting larger crops of soybeans unless controls are levied by the government.

Although much emphasis has been placed on South Carolina produced grain, the facility can also act as a handler for mid-western grains to be exported. Close behind the first export of soybeans, another ocean-going freighter called at the terminal to load 2000 tons of soybean meal. This meal was unloaded at the facility from rail cars which came to Charleston from Decatur, Illinois.

This farmer-controlled Marketing Association has not been satisfied with increasing the income of soybean producers. The Association shipped a load of fresh peaches to Europe in 1962 - marking another first in S. C. agricultural circles. That shipment was so successful, the Association has been working with the peach producers of the state in planning volume shipments in 1963.

The Marketing Association is also investigating foreign markets for sweet potatoes, pecans, grape juice and other South Carolina produced commodities.

Just sixteen months ago, no one on Farm Bureau's board of directors ever dreamed that the Marketing Association could mean so much to the state's agricultural economy in so little time.

1963 AGRICULTURAL CALENDAR

April 19	Annual Clemson - Georgia Student Branch ASAE Banquet University of Georgia, Athens, Ga.
20	Block and Bridle Club Little International-Clemson, S.C.
26	Jersey Heifer Sale - Newberry, S. C.
May 4	Southeastern Forestry Conclave - Clemson, S. C.
10	Agricultural Economics Club Faculty-Student Banquet - Clemson, S. C.
25	Holstein Spring Heifer Sale Saluda, S. C.
June 4-7	State FFA Convention - Clemson, S. C.
11-15	Reciprocal Meats Conference Oklahoma State University, Stillwater, Okla.
17-19	American Dairy Science Association Annual Meeting Purdue University, Lafayette, Ind.
24	South Carolina Hereford Field Day
July 9-12	Vo-Ag Teacher's Conference - Clemson, S. C.
22-26	State 4-H Club Week-Clemson, S. C.
Aug. 13	South Carolina Guernsey Fall Sale - Saluda, S. C.
21	South Carolina Holstein Sale - Columbia, S. C.
26-29	Farm and Home Week - Clemson, S. C.
Oct. 21-26	South Carolina State Fair - Columbia, S. C.
Nov. 8	Saluda Guernsey Sale - Saluda, S. C.

TO A FRIEND, TEACHER, AND LEADER

In recent weeks and months, many tributes have been bestowed upon very deserving Professor "Big Ben" Goodale. It can be said without reservation that not one of the tributes paid him was given in cold formality, but all were given with an honest, heartfelt appreciation for what he has meant to the several thousand students he has taught, to the dairy industry he knows and serves so well, to the college community to which he has devoted so much time and effort, to the many professional and honorary groups which know him as an active member and leader, and to the many student organizations he has founded and advised over the years. Is there another who can claim active membership in Phi Eta Sigma, Alpha Zeta, Mu Beta Psi, Blue Key, Tau Kappa Epsilon, American Association for the Advancement of Science, American Dairy Science Association, and American Association of University Professors? After learning of his broad scope of activity and knowledge, it perhaps comes as less of a surprise to find him listed in "American Men of Science," "Who's Who in American Education," and "Who's Who in the South and Southwest." Indeed he has led a full life as a dairy plant operator, dairy manufacturing expert, professor, department head, extension specialist, leader in faculty organizations, consultant to dairies in eight states, leader and adviser of student organizations and activities, including religious and athletic activities, church leader and lay preacher, civic leader, and a decorated soldier.

On this the Twenty-fifth Anniversary of The Agrarian, we the staff proudly salute Professor Goodale, on behalf of all past Agrarian Staffs, for the part he played in founding and advising our publication. We join with clubs such as Alpha Zeta which presented him an official citation for his service, The Student Branch of American Dairy Science Association which presented him the traditional "Guernsey Jug" Dairy Achievement Award, the South Carolina Dairy Association, and the State Dairy Cattle Clubs in paying tribute to a friend, teacher, and leader.

Lacking words to adequately express our sentiments, we add simply and sincerely "Thanks, Prof. Goodale, for being an unforgettable example and inspiration for our own fullest personal development."

SUMMER GRASS FOR THE SOUTH

by

Boyd Graves and Stan Keaton

Grassland farming today is playing an important role in Southern agriculture. Increased per acre yields and reduced acreages of many cultivated crops have resulted in more and more productive land being planted to grass. Favorable climate and soil in the South make the region well suited for grassland farming.

Farmers were surprised when breeding work was begun in 1939 to improve Bermuda grass, because prior to this time Bermuda grass had been considered only a pest which interfered with the production of row crops. Coastal Bermuda grass, a superior Bermuda grass hybrid, was developed as a result of this breeding program. Since its release for commercial production in the early 1940's, over three million acres of this high-yielding grass have been established. Coastal Bermuda grass has become one of the better-adapted summer grasses in the South.

Coastal Bermuda grass is remarkably well adapted to almost all soil types of the southern one-third of the United States. It grows well on the light sandy soils of the Coastal Plain, the heavier soils of the Piedmont, and the silty soils of our river and bottom lands. However, good or moderate drainage is required for growth.

The wide acceptance of Coastal Bermuda grass throughout its area of adaptation may be partially attributed to its multiple uses, which include grazing, hay, silage, pellets, and "greenchop."

Grazing trials have shown the superiority of Coastal Bermuda grass over many other summer grasses in amount of forage produced. When used as a hay crop, it produces high yields of palatable and nutritious forage. Coastal Bermuda grass fertilized with 200-400 pounds of nitrogen per acre usually produces forage with a crude protein content of 15 percent or more and a TDN content as high as 67 percent. Yields of 8-15 tons per acre of hay have been reported on properly fertilized fields.

In addition to being used for grazing and for hay, Coastal Bermuda grass is being utilized more and more as silage. When properly fertilized and managed, yields of 15-20 tons per acre if silage can be obtained. Coastal Bermuda grass silage is an excellent feed for all farm livestock.

Livestock producers in the South have been at a disadvantage in the feeding of pellets, mainly because of high shipping costs in transporting this type feed from others. Data have been obtained which indicate that Coastal Bermuda grass, when pelletized, will retain 15-20 percent protein and acceptable amounts of vitamins, especially vitamins A and D.

With the introduction of Coastal Bermuda grass to Southern grasslands, the revolution to grassland farming was initiated. Coastal Bermuda grass is superior in yields to other summer, permanent-type pasture grasses for grazing, hay, and silage, and its palatibility and nutritive value have proven to be acceptable. The use of Coastal Bermuda grass for summer grazing, along with its other multiple uses, has done much toward promoting livestock production in the South.

RURAL PEOPLE ON THE MOVE

by
Joe McComb

We've broken land and cleared it, but we're tired of where we are.
They say that wild Nebraska is a better place by far.
There's gold in far Wyoming, there's black earth in Ioway.
So pack up the kids and blankets, for we're moving out today.
---Benet

Americans have always been a moving, restless, courageous people. During the Colonial Period, they often packed up and moved to richer land. These were farmers moving to new farm land. At this time nine-tenths of the people of America earned their living on the farms, and this number did not show any appreciable change until after the War Between the States. By 1870, about half of the workers were on farms. Soon the open range began to shrink and the frontier was a thing of the past. By the mid 1890's, although America was still predominately a land of agriculture, the number of farmers was about 42 percent of the nation's workers. With the advent of technology about the turn of the century, a striking change took place in all aspects of America. Its effect upon agriculture was quite significant, particularly in the population shift from rural to urban areas. By 1940 only a little over 18 percent of the nation's workers were farmers.

The trend of the nation is indicative of what was happening in the South.

Let us take a small segment of the South, Orangeburg County, South Carolina, and see how the population has shifted since 1940, why it has shifted, and what effect this shifting has had on agriculture in this area. From this small area, we will get a picture of what is happening in the South.

According to the U. S. Census, the rural farm population was 40, 258 in 1940; in 1960, the number had decreased to 20, 904. The 1960 labor force for the county was estimated at 25, 000 of which 7, 000 were engaged in agriculture. Data furnished by the Employment Security Commission indicates a loss of 3, 660 agricultural employees during the 1950-1960 decade and a gain of 4, 500 in non-agricultural employment. Migration from the county averaged a little over a thousand persons per year in each of the ten years.

In a personal interview, Mr. J. C. King, County Agent of Orangeburg County, said that although the county is predominately a rural county, the number of people engaged in farming is declining rapidly. In 1940 - 1960, the population increased 7 percent; the rural non-farm population increased 161 percent; the urban increased 32 percent; but the rural population decreased 50 percent.

Why have they left the farms? Government programs that curtailed crop acreage caused many workers to leave the farm; on top of that came the war, the expansion of defense and war industries and higher wages. Small farmers have not been able to raise their volume of production to meet the competition of the larger farms; therefore, they have shifted to non-farm employment. Then too, highly mechanized farms need fewer workers.

How does this shift affect agriculture? The trend is toward larger farms with more machinery. Mr. King said that the average farm acreage in Orangeburg County in 1930 was 57.6 acres, whereas it was 133.7 in 1959. During this time the number of farms decreased from 7,329 to 3,415. He stated that 25 percent of the county farmers produce and market about 75 percent of the total volume of agricultural products. He also stated that there is a decided drop in the number of share-cropper and tenant operators. There is a shift from row crop to cover crops, and about one-fifth of the cropland has been put into Conservation Reserve and other government farm programs. Another interesting fact that the County Agent brought out was that there are currently in the County only fifty farm operators under twenty-five years old and 557 who are sixty-five or older.

The farmers no longer try to be self-sufficient; they have turned to specialization; they contract with firms to do jobs such as crop dusting and application of fertilizers. There is an increased interest in cooperative marketing, and an eagerness to try new ideas. The new field design for power farming in some sections of the South is an example.

The picture, then, that we get of the South's agriculture as revealed by the data from Orangeburg County, South Carolina, indicates definite trends. Agriculture in the South is becoming a highly mechanized, competitive and commercial business which will require the best managerial skills, business principles, and scientific practices. Those who have the skills, ambition and energy, can look forward to a successful career in agriculture. With increasing use of capital and management skills, there may be in some cases a strong call to educate the kids and enlarge the farm. None the less, it appears that many more small inefficient farmers must yet say, "So pack up the kids and blankets, for we're moving out today."

OLD CROPS - NEW WAYS

by
Jeff Denit

Picture, if you will, thirty-five acres of beautiful, rolling farmland vividly green in a mature crop of alfalfa. You have hired fifteen capable laborers with scythes to cut the alfalfa for hay. At the day's end, one-hundred and twenty man-hours later, the crop has been cut. Some patches of alfalfa are still standing but you have to allow for low efficiency when dealing with manual labor. At least the crop has been harvested. Tomorrow, the men will return to pitch the hay onto a wagon and haul it to the barn - unless weather interferes.

This illustrates the situation as it was in the South just sixty years ago, but the Agricultural Revolution brought automation to society and the Agricultural Engineer brought mechanization to the farm. Vast research on the part of Agricultural Engineers, in cooperation with other engineering fields, has resulted in phenomenal improvement in farm output, harvesting methods and overall production efficiency.

Farm mechanization could have occurred anywhere in the United States about 1900, but it is particularly significant in the South where even though a farming economy prevailed, mechanization arrived relatively late. At any rate, let's re-analyze our problem and harvest that alfalfa crop using the modern machinery and methods of today's progressive agriculture. Thirty-five acres seems like a great amount of land to harvest properly in one day-and it is! Now, however, in fourteen man-hours, one farmer can mow the field, bale the hay and figure the profits. After all this he is still available for a night with the "boys." That is certainly a vast improvement in labor costs and efficiency!

Certainly, no treatment of the advances in Southern Agriculture is complete without mention of cotton, even if it isn't "King" anymore. Where thousands of laborers once hand-picked the cotton crop a few hundred self-propelled machines now move through the fields and pick ten acres a day per machine - clean.

The dark horizons of farming have receded, but there is still much to be improved upon. Agricultural Engineers are constantly at work to devise new machinery, methods, and better ways to apply them. The South is an integral part of the greatest industrial and agricultural nation in the world; it will continue to be through further research and increased automation on the farm.

TRENDS IN DAIRYLAND, SOUTH

by
Jon M. Rogers

The dairyman of today is a production genius. Let anyone who doubts this statement review these revealing facts. Twenty years ago there were approximately four million dairy farmers, while today there are only about one million. Twelve years ago there were twenty-two million dairy cows, but today there are only seventeen million. The average Dairy Herd Improvement Association herd has grown from twenty-seven to thirty-nine cows in fifteen years, and the average milk production per cow per year has increased more than seventy percent in the past twenty years.

Dairy farmers have accomplished this miracle of production in response to challenges posed by the "cost-price squeeze," the acute "farm labor shortage," and changes following the war years. Faced with these challenges, the dairy farmer immediately set about streamlining and modernizing his entire operation. Today, the dairy farmer with his up-graded herd, modernized milking set-up, bulk tank, and mechanized feeding units is a businessman with a huge investment.

Agricultural leaders in the South have emphasized in the past that the Southeast has almost unlimited possibilities for increasing milk production and sales. We have the advantages of mild winters which permit year-round grazing, and profitable markets created by current deficit supplies of milk products and an increased urban population. Another important point is the current availability of labor due to "under-employment" which has resulted from past over-emphasis on row crop farming.

Within our southern sector there are two classes of dairymen. There is the one with at least forty to sixty high-producing cows, who has sufficient land in good pasture and crop land of high fertility to support these cows. This commercial dairyman can produce high quality milk in sufficient volume to pay for the dairy barn equipment. He is the ideal producer of Grade A milk, with low overhead per cow, and a substantial, regular income from his herd.

On the other hand, there is the group of farmers who have small herds of from one to five cows, and who just do not have the land or capital necessary to become commercial dairy farmers. Without doubt, the widespread use of artificial insemination and the introduction of dependable forage crops can increase the milk production on small farms utilizing dairying as a sideline.

Farm receipts from the sale of dairy products in the South have increased in the past ten years, indicating the growth and growing importance of the dairy industry in the South. With a decrease in the total number of farms reporting milk cows, an increase in the number of dairy farms, and an increase in the average number of cows per dairy farm, indications are that dairying is becoming more widely a full-time operation, rather than a supplementary enterprise.

RESEARCH ON STEM ROT RESISTANCE

by
Ronnie Robbins

The following is a summary of the research paper presented by Horticulture Junior, Ronnie Robbins, at the Regional meeting of the Collegiate Branch of the American Society of Horticultural Science in Memphis, Tennessee, in February. Ronnie will compete in the national contest against other regional winners in the summer. For success in his early research and for winning with his paper, he is to be congratulated.

Stem rot, or fusarium wilt, of the sweet potato is very widespread and is very destructive in many areas. Each year growers suffer decreased stands and decreased yields from stem rot. Sometimes entire fields are completely wiped out.

Unfortunately, the Puerto Rico, one of the most important varieties of the soft-fleshed type sweet potatoes, is very susceptible to stem rot. Varieties showing degrees of resistance have been developed and are gaining acceptance in some areas. However, susceptible varieties are still being used extensively because they exhibit some desirable characteristics which the stem rot resistant varieties do not have. For this reason, some cultural practice to reduce the susceptibility to stem rot would be very desirable.

The experiments reported in this paper were initiated to ascertain the effects of calcium nutrition on stem rot of sweet potatoes and the effect of holding the slips prior to exposure to the disease organism.

The stem-rot susceptible variety Puerto Rico was used. The roots of the slips were trimmed and the slips dipped for fifteen minutes in a suspension containing the stem rot fungus. Immediately after inoculation, the slips were transplanted to a greenhouse bench in rows six inches apart. The temperature of the bench was kept at $85^{\circ} \pm 2^{\circ}$.

To determine the effect of calcium nutrition applied during sprouting, two lots of sweet potatoes were bedded. One lot received a full nutrient solution of a high calcium content along with weekly foliar applications of calcium chloride. The other lot received a minus calcium nutrient solution.

To determine the effect of calcium nutrition applied after transplanting, two replicates of 160 plants each received a minus calcium nutrient solution after transplanting.

To determine the effect of a healing period between the time of pulling the slips and inoculation, one group of 160 slips was pulled and the roots trimmed 96 hours prior to inoculation. A second group of 160 slips was pulled and the roots trimmed 48 hours prior to inoculation. A third group of 160 slips was pulled and the roots trimmed 24 hours prior to inoculation. A fourth and final group of 160 slips was pulled and the roots trimmed 6 hours prior to inoculation. During the period between the time the slips were pulled and the time of inoculation, the slips were kept at 85° F ± 2°, and under humid conditions.

In this experiment, those plants which were held at 85° F ± 2° and high relative humidity for 24 hours between pulling and inoculation showed much more resistance to stem rot than did those plants which were inoculated 6 hours after pulling. The plants which were held for 48 and 96 hours exhibited about the same amount of resistance as did those which were held for 24 hours. Thus, it is concluded that suberization of the sweet potato plants in this experiment occurred within 24 hours.

Following are the conclusions drawn from this experiment:

(1) The results on calcium nutrition were inconclusive because of a burning and stunting effect caused by the high concentration of calcium chloride applied as a foliar spray.

(2) Slips which received either a 24, 48, or 96 hour healing period at 85°F and high relative humidity between the time they were pulled and the time they were inoculated showed much more resistance to stem rot than did those slips which were inoculated 6 hours after pulling.

(3) Apparently 24 hours only was necessary for this beneficial effect. And since this beneficial effect occurred within 24 hours, it is assumed that suberization rather than periderm formation was responsible.

GRADED FEEDER CATTLE SALES

by
George Dorn

Within the last decade, many changes have taken place in Southern agriculture. One relatively new addition to the livestock industry has been feeder cattle sales. These sales are growing in magnitude in South Carolina, and are greatly benefitting the state's cattle producers.

First and foremost they supply a good market for feeder cattle; secondly, they insure that only the better quality animals will be sold. To begin with, only steers and heifers of the beef breeds may be sold. Prior to the sale, these cattle are field inspected by a county committee. Every male animal must be castrated and completely healed before this animal can be sold. All must be dehorned before being approved by the committee. The producer must show evidence that all cattle sold have been vaccinated for blackled, malignant edema, and hemorrhagic septicemia within a specified time limit. The cattle sold should weigh at least 300 pounds, and must grade "medium" or higher. All heifers must be guaranteed open and must have been calfhood vaccinated for brucellosis.

These are just a few reasons why only higher quality cattle are consigned to these sales.

Fifty percent of all the cattle sold in these sales remain in South Carolina, providing the housewife with the high quality beef which she desires.

There are five feeder cattle sales held annually in South Carolina each fall. These are held in Bennettsville, Greenwood, Spartanburg, York, and Ehrhardt.

In 1962, a total of 4,344 head were sold in the five sales. These constituted cattle produced by 240 producers from 31 counties.

Of the total number of cattle sold, 3,038 were steers. They weighed an average of 492 pounds and brought an average selling price of 25.64 cents per pound. The heifers sold for an average of almost 2.5 cents less per pound than did the steers.

The greatest percentage of steers graded "good." while most of the heifers graded "medium."

Yes, feeder cattle sales are a growing part of South Carolina's livestock industry, and each year they prove their value by the number and quality of cattle sold through them. Last year, the gross income from the five fall sales amounted to slightly over $500,000.00.

A NEW FERTILIZER

by

James H. Crawford

Sweet potatoes have been grown in the Southern and Eastern states for more than a hundred years, but not until the last fifteen years has any particular emphasis been placed on the production of a sweet potato that has high quality. Considerable work has been done in breeding potatoes that have a high yield, disease resistance, good color and cooking characteristics, and storage qualities.

In December 1962, the Crop Reporting Service for South Carolina estimated annual sweet potato acreage during the period 1951-1960 was 19,400 acres. The acreage in 1961 was 8 thousand acres harvested, and in 1962, 9 thousand acres. The average yield of sweet potatoes during the 1951-1960 period was 98 bushels per acre. In 1961 the yield was 111.5 bushels per acre, and in 1962, 121.2 bushels per acre. The value of the crop in 1961 was $2,125,000, and in 1962, $2,552,000.

CaroGold, a new sweet potato variety, which was released by the South Carolina Experimental Station in 1958, has very good characteristics except poor sprouting habit. The need for development of a treatment that would increase sprout production and yield of the CaroGold prompted this study. Previous experiments with sweet potatoes and other crops indicated humic acid fractions would increase plant growth and yield.

A propagating media consisting of half creek sand and half loamy soil was used in the bed. The media was mixed thoroughly and three treatments were prepared for the quadruplicate plots as follows: (1) Check, (2) one, and (3) two grams of humate per pound of media. The sweet potato roots, which were composed of comparable lots of 20 roots each, were treated by soaking in a solution of water containing 10 percent humate. Duration treatments for time of soaking were: check, 30, 60, and 90 minutes. After soaking, each lot of roots was bedded in each of the media treatments.

Plants from the treatments were pulled five times, counted, weighed and planted in a field experiment. The treatments in the field consisted of a check; 400 and 800 pounds per acre of a 12-9-6 inorganic fertilizer; and 400 and 800 pounds per acre of a 12-9-6 humate.

There was a significant increase in number of sprouts with the media treatments. The soaking of the roots decreased sprout production although sprouts were produced 10 days earlier when compared to other treatments. The yield of number one grade potatoes was significantly increased by the soaking of the roots in the 10 percent humate solution. Results of the media treatment show a significant increase in yield of number two grade of sweet potatoes. Interaction of the media and soaking treatments resulted in a significant increase in yield of the number two grade.

The field experiment resulted in a significant increase in yield of all grades of potatoes except the jumbo grade.

THE CHANGING PEACH INDUSTRY

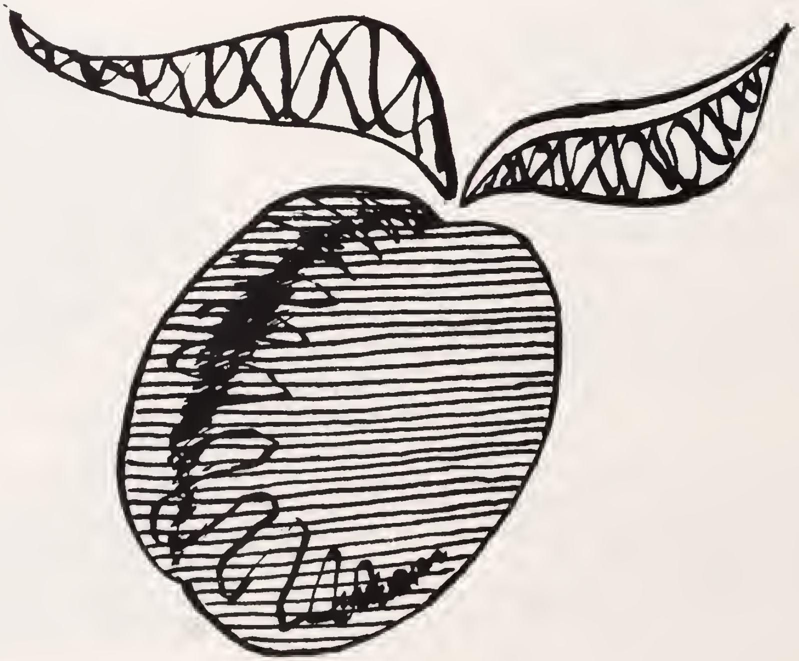
by
Lem Dillard

In the production of peaches, as in most other industries, there have been many changes in the past 25 years which have greatly affected the industry.

It is the opinion of most peach producers that the industry was more prosperous 25 years ago than it is today. The grower then only had to worry about whether or not the weather would permit him to have a peach crop. In those days there were primarily two or three varieties that were grown -- Elberta, Golden Jubilee, and Georgia Belle. Each of these ripened at a different time and there was always a good market for peaches. Increasing production costs and stagnant market prices are requiring more and more efficiency for success today.

Peaches themselves have undergone a revolution in the last 25 years. Since the time of the three-variety peach industry, many new varieties have been introduced and sold to the orchardist as "the peach of tomorrow." Many of these new, "fabulous varieties" have failed in their desirable characteristics and been discarded after only a few years. Some have developed as advertised and improved the quality and appeal of peaches, but while these successful varieties have helped, others of poor quality have created a bad taste in the mind of the consumer. It is true with peaches as it is with most other things that one always remembers the bad longer than he remembers the good. The poor varieties have hurt the market for high quality peaches because of their poor consumer impression.

The methods of growing peaches have changed with the introduction of new methods of cultivation, fertilization, and pest control. Irrigation has helped growers produce larger and better quality peaches, especially



during dry weather. The main help that the orchardist has received has been along the lines of controlling peach pests. Research has developed new insecticides which now control the peach tree borer and fruit moth to a greater degree, making the orchardist's work much easier. Clemson College's departments have done excellent work in South Carolina along this line.

There have been so many changes in the methods of packing peaches for shipment that it is hard for the grower himself to keep up with them. Some of the better changes have aided in getting the peaches to market without serious bruises or brown rot damage. One of the first changes from strictly hand packing was the "defuzzer" which brushes the fuzz off the peaches. About the same time, a new machine was developed which sized the peaches automatically, These techniques speeded up the process of packing peaches and added to consumer appeal. Now, varying sizes of containers are used to cater to the desires of all consumers--another consumer appeal.

One of the better developments has been the introduction of hydro-cooling, in which packed peaches are cooled to a temperature of near 40° in a shower of cold, clear water just before they are loaded for shipment. Cooling helps to reduce brown rot while the peaches are enroute to market. The old defuzzer is now being replaced by a machine which washes and brushes the fuzz off the peaches. A hot water bath for a few seconds prior to washing may help eliminate brown rot in the future by destroying many of the causative spores.

The methods of shipping peaches to the market has also changed. The trucking industry waged economic battle with the railroad during the last twenty-five years to become the primary method of peach shipping. Recently though, the railroads introduced a combination of shipping methods-hauling truck loads of peaches on boxcars, "piggy-back" style. The truckers have already begun to fight this by increasing their capacity with double decker trailers.

Until very recently all peaches grown in the United States have been marketed in the United States and Canada. However, last year experiments proved that exportation of peaches was possible. Some growers plan to ship large quantities over-seas for marketing this year. If this proves profitable it could prove to be a real boost to the peach industry.

Though many valuable gains have been made in the past twenty-five years, the peach industry will need to make many adjustments if it is to survive as a prosperous industry. If lack of demand becomes a serious problem, it will be because growers continue to market poor quality and undersize peaches, in turn, decreasing the market for the better peaches. Growers must realize the need of a marketing agreement to include the quality and size of peaches that may be shipped. An agreement of this sort would greatly augment the demand, and cause all growers to produce larger and better quality fruit. Until this happens the old Elberta may remain as the most valuable and dependable peach - as it has been for the last two or three years.

FROM THE FOREST -----

by
Jimmy Potts

Forestry continues to expand rapidly in the South because of new techniques and industries made possible by research. These industries have helped make possible the rapid industrialization of the South which has occurred in the past 50 years. During these 50 years, many improvements have been made in Southern forest industries.

Today, many of the Southern pulp mills are installing equipment to economically extract chemical compounds from many of their waste materials. Thus far, some 2,600 organic chemical compounds have been processed from trees and scientists believe that they have only "scratched the surface."

Today, small sawmills are able to compete with large mills by installing log debarkers and chippers. With these new additions, the small sawmills can chip most of their waste materials, such as slabs and edging, and sell them to pulp mills. New and better uses for lumber have been found, which add to the utility of lumber. New processes for treating lumber exposed to weather have added many years to its life. Laminated wood arches are replacing steel where high strength and beauty are required.

Particle board is a new product made from industrial wood residues. The wood residues are ground into fine particles, mixed with glue, and forced into a sheet by a hot press. The board has been widely accepted by the furniture industry.

Southern Pine plywood is not new, but many problems which have made this plywood uneconomical to produce have been incurred in its manufacture. At the present time, many of these problems have been solved and the South is looking forward to its perfection.

The mechanical dinosaur is a pulpwood harvester which de-limbs trees up to a height of 60 feet, tops the trees, shears the stem at ground level, and lays the logs on a pile. The whole operation can be accomplished on a single tree in a mere 45 seconds. It was designed for clear-cutting operations on level terrain, and its application extends from the South to the Lake States.

Silvicides are chemicals which help the silviculturist kill unwanted species of woody plants. One of the most promising chemicals is a methyl-urea compound called Fenuron. It can be purchased in pellet form and is applied by broadcasting around the base of unwanted trees. It is thought to be selective in its killing power.

Genetic studies are pointing the way toward better Southern forests. Since 1956, the South has established 2,400 acres of seed orchards using extensive genetic knowledge. These orchards contain trees that have been carefully selected because of tree vigor, resistance to disease, superior wood properties, and small limb size.

Airplanes are being used to drop water and fire-retardant chemicals for forest fire control. Also, a radio-controlled guided missile is being developed for the United States Forest Service. It will carry a pay load of 100 gallons of fire-retardant chemicals for forest fires in inaccessible terrain.

Television cameras mounted on fire towers are being tested as a possible means of detecting forest fires. If this proves satisfactory, fire towers may be unmanned in the future. Television is also being used in some industries to instantly spot trouble along the assembly lines. The whole plant can be placed under the watchful eye of one man by putting a series of cameras throughout the plant.

Aerial photographs are being used to aid forest management. They are also used, to a limited extent, in timber cruising and will be more valuable as the techniques of measuring volumes are perfected.

Computers are being used to reduce and help analyze data.

Forests not only produce wood, but are also used to produce wildlife, to conserve water, and to provide recreation. Many of the large owners, and some of the smaller ones, have realized this and are now managing for multi-use forestry.

The development of Southern forests in the past 50 years has been little short of spectacular. With new and wider uses of forest products, it seems that many more Southern acres will shed their eroded appearance for the fresh greenness of new forests.

SOUTHERN POULTRY BOOMS

by
Maurice Gregory

As time passes, the type of farming in any particular region is likely to change. This change may be brought about by technological changes or changes in soil condition. The South has been the longtime victim of soil depletion and soil erosion. Because of these conditions there was a need for a change in the type of farming in the South.

Besides the conditions brought about by nature and man's neglect, there have been other reasons for a different type of farming. Some of these were the decline in acreage allotments for cotton and tobacco and the competition from other sections of the country for these crops.

All of these conditions combined to cause a need to change the type of farming, but to what? Most of the farms in the South were small, so the farmer was looking for something that would require only a small amount of land and capital, and still bring in sufficient returns on his small farm to support his family. In many cases the answer was chickens.

The conditions mentioned, plus low labor costs, low housing costs, and low fuel costs were very favorable to the poultry industry in the South. Because of all these favorable conditions, the South has increased the production of poultry products at a more rapid rate than the rest of the nation. The South has increased its production of broilers, for example, to a point that it produces about 65 percent of the nation's total, as compared to 35 percent 20 years ago.

The poultry industry has made such large gains in South Carolina that it is now rated third in percent income to the farmer. Eggs are now the most important animal product in the state in terms of gross farm income. The cash receipts from the poultry industry in the United States amounted to approximately 3.1 billion dollars in 1961.

The contributions to agriculture have not only been financial. The poultry industry has contributed greatly to the fields of medical research, nutrition, genetics, and artificial insemination. It has also helped the feed industry climb to the 13th largest business in the United States.

Other industries that have benefited from the increase in poultry production have been the makers of automatic equipment for poultry houses. Also the producers of medical supplies and antibiotics have benefited from the rapid increase that the poultry industry has made.

Today the poultry industry is continuing in its tremendous gains, and it is affecting more and more people by giving them a new product to produce on poor land.

NEEDED: VOCATIONAL EDUCATION

by
Thomas V. Nolan

It has been possible in past years for relatively uneducated and unskilled Americans to obtain employment, and whether the financial returns were great or small, all have been able to earn a livelihood. However, we are now finding that vocational education is taking an increasingly more important place in labor force preparation.

Of these vocational fields, probably the most important is Agriculture. On the average, about 25% of the provider's paycheck goes for food for himself or his family. This is a considerably lower figure than that of a few years ago, and the increased values in foods and other agricultural products today, accompanied by their price drops, is greatly attributable to Vocational Agricultural Education.

Wolfbein (1) has pointed out that vocational training in fields other than Agriculture must be made meaningful, especially for those past their formal periods of education. Greater demands by industry for unemployed agricultural labor will require more and more vocational training for them to succeed in their new vocations.

An accelerating technology brings with it obsolescence of skills. It is no longer possible for a person to train for, enter, and then stay until retirement in one specific occupational field without further enlightening preparation along the way to keep him well informed of the technological advances and other changes which have been made.

Vocational education is facing a fabulous future which promises an unprecedented expansion and development for all of its programs and services. With every hour of time our population increases by approximately 327 persons, each one a potential candidate for the labor force. This means that this same number of "extra" people must be clothed, fed, housed, educated, and in other ways, served and provided. These persons will have no choice but to work in the occupation which society has designated as imperative toward maintaining our way of life. About 85 percent of this group will find work within the framework of vocational education--agriculture, business, distribution, trade, industry, and technology.

We have become quite sophisticated about the educational levels of all members of our labor force. We take pride in the fact that our national educational development is growing each year. But people must be taught to work, because work is basic to our culture (2). This is probably more true of Vocational Agriculture, than of many other fields.

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1. Wolfbein, Seymour L. Training Available People for Available Jobs, American Vocational Journal, p. 6, October, 1962.

2. Barlow, Melvin L. Vocational Education in the Fabulous Future, American Vocational Journal, p. 9, October, 1962.

25 AGRARIAN YEARS

by
Jim Hite

The Agrarian is twenty-five years old this year! It must seem like a short time to those professors and students who undertook to present that first issue back in 1938, yet much has happened in the South since then. No longer is our region the land of slow, rural life; it has become a region bursting with vitality and obsessed with joining the mainstream of American economic and social progress. Gone from the southern farm is the mule and the sharecropper and in their place are self-propelling herbicide applicators and college-educated farmers. They have been a stormy twenty-five years for the South, and for The Agrarian; but, all in all, they have been years of growth and maturity.

Before The Agrarian hit the campus at Clemson, the agricultural students had periodically published an Agricultural Journal. Dr. G. H. Aull, now Head of the College's Department of Agricultural Economics and Rural Sociology, was a member of the staff of that publication. But the Journal fell into decline, as college publications often can, and when an Agricultural School magazine was revised, it was named The Agrarian. In 1938, the educated people of the South were still freshly aware of the arguments of the "Agrarian" writers from Vanderbilt -- John Crowe Ransome, Allan Tate, Andrew Lytle, Robert Penn Warren , Donald Davidison, Frank Ousley --- and quite probably the influence of their work had much to do with the name given the new publication. But the "Agrarian" poets were opposed to change in the South; Clemson's Agrarian has never opposed change per se. Rather, The Agrarian has been dedicated to agricultural progress. In common, however, with the "Agrarian" poets is the magazine's central thesis: that the strength of the South lies in her rural people and her rural institutions.

The Agrarian's first editor, Harris L. Beach, now teacher of Vocational Agriculture at St. George, South Carolina, worked closely with two men, who, by all odds, can properly be called the co-founders of The Agrarian, Dr. B. O. Williams, formerly of the Rural Sociology staff, and Professor Ben E. Goodale, Head Emeritus of Dairy Science. Professor Goodale has just retired from the active staff at Clemson as The Agrarian enters this twenty - fifth year, and perhaps more than any other man, he represents the historv of the magazine. As a Dairyman, "Prof" Goodale has contributed very greatly to the rapid growth of the South's dairy industry, thus bringing thousands of additional dollars to Southern rural people. As a church leader and lay preacher, he has enfused in the Clemson Community, and in the hundreds of students who have known him, a spirtual quality that points toward values realized only by dedicated service, personal excellence, and human brotherhood - values without which the South and The Agrarian would become no longer worthy of effort. Professor Goodale has remained at Clemson throughout the entire quarter century, and because he has, The Agrarian has been a richer and more inspired publication.

B. E. Goodale, co-founder, speaks:

In the spring of 1938 plans were made to publish the first issue of The Agrarian. Harris L. Beach was the first editor and the faculty advisers were W. H. Washington, B. O. Williams, and B. E. Goodale.

The Agrarian has served the School of Agriculture well over the years. Student Agricultural Clubs and a small group of dedicated agricultural students have nursed The Agrarian through some difficult years. In more recent years agricultural organizations in South Carolina have assisted student staffs by financing some of the issues.

We still have The Agrarian after twenty-five years because each year a few agricultural students are willing to do the necessary work with no reward other than the satisfaction of serving and creating.

The new 1963-1964 Agrarian staff will learn the hard way that much creative imagination is a must and there will be many hours on each issue of careful, painstaking, routine effort. The task is further complicated by the fact that the staff members have had no courses in journalism and only a very small number have had any experience with a publication like The Agrarian.

The success of any publication depends on the thorough organization and whole-hearted working together of its staff members. We are indebted to the faithful few who have worked so hard to give us The Agrarian over the years, and also to those who have helped with the finances. The Agrarian

has been truly given over the years to agriculturists and friends of agriculture. No charge has ever been made for any issue.

To be a member of the staff of The Agrarian is a valuable experience, and those whose good fortune it is to share it are better fitted and better trained as a result. Past editors never tire of recounting their common difficulties, their personal contacts, and the fraternal spirit derived from working on a publication created to adequately interest and serve their fellow agricultural students.

The next twenty-five years will be challenging for The Agrarian. There will be no place at Clemson College for a weak agricultural publication for students. The Agrarian's future is as promising as dedicated staffs of future years wish to make it.

Harris L. Beach, first editor, speaks:

It gives me great pleasure to write a short article for The Agrarian on its twenty-fifth anniversary. It seems like only yesterday when we began the initial organization of the magazine. However, many commendable editions have come off the press since its beginning.

I would like to give credit to the late Dr. E. W. Sikes, President of Clemson College; Professor B. E. Goodale, Dean W. H. Washington, and Dr. B. O. Williams for their untiring efforts in the early organization and production of The Agrarian. Without their counseling and guidance I sincerely believe that the magazine would have been short-lived. I would like to pay tribute to the first staff for each of them did their part in making The Agrarian a worthwhile magazine, as have the staffs that have followed.

But where does The Agrarian go from here? What about the next quarter century? Certainly, the time ahead is as full of challenges as the road just traveled. And The Agrarian must be ready to face these challenges, and to help rural leaders to face them. Clemson is a busy school; academics press hard on our students and the time for journalistic endeavor must be jealously guarded. It costs money to publish this magazine, and The Agrarian has no source of income except the generousity of commercial firms and alumni; yet money must be found. Why? Because the South is getting in sight of its goal - economic prosperity, political equality, human brotherhood - and we can ill afford to falter. The Agrarian must fight for improvement in the quality of rural education; for rural industrialization; for rural zoning, community development, the enrichment of the rural church; it must continue to disseminate information about breakthroughs in the production of farm products, for better uses of our land and forests, and for water conservation. And The Agrarian will do this. Because Clemson has felt the hand of men like G. H. Aull, Ben Goodale, R. F. Poole, and B. O. Williams, we can do no less.

BETWEEN THE FURROWS

PRE-VET CLUB

Since this is the first article to appear in *The Agrarian* by the Pre-Veterinary Medicine Club, it will cover the club's general organization as well as past, present, and proposed activities.

The Pre-Vet Club is presently composed of thirty-one members who are enrolled in Pre-Veterinary Medicine or following the general Pre-Vet curriculum.

Under the supervision of President Jack Wheeler and the guidance of Dr. W. C. Godley of the Animal Husbandry Department, the club has enjoyed a most productive and enlightening first year.

The club's first activities were of the guest speaker variety, featuring local and district veterinarians. A more recent meeting spot-lighted two students from The University of Georgia, where many of the Pre-Vet students will be seeking enterance upon completion of their work at Clemson. Club plans for the immediate future include election of officers for the coming year and a banquet on May 7, 1963. Dean Jones, Head of the Veterinary School of the University of Georgia will be the honored guest and principal speaker at the banquet.

FFA AWARDS AND ELECTIONS

On March 15, 1963, the Clemson Collegiate Chapter of the Future Farmers of America held its annual awards banquet at Dan's Dining Room. Mr. L. L. Lewis, state executive secretary of the South Carolina Association of Future Farmers of America, was guest speaker. The banquet was attended by the chapter members and the faculty of the Department of Agricultural Education.

Awards were presented to outstanding students in Agricultural Education. Those presented awards were: Benjie Rhoad, Senior; Gordon Chipukites, Junior; Byard Stone, Sophomore; and Stewart Garret, Freshman.

The Clemson Collegiate Chapter of the Future Farmers of America held its annual officer election meeting Tuesday, March 5, 1963 and the following men were chosen to represent the club in these capacities during the 1963-1964 school year; President, James R. Ballington, Lexington, S. C.; First Vice President, Gordon D. Chipukites, Milan, Ohio; Second Vice President, Byard Stone, Johnsonville, S.C.; and Secretary, Stewart H. Garrett, Fountain Inn, S. C. Also elected were: Treasurer, Luther W. Waters, Batesburg, S. C.; Reporter, Thomas V. Nolan, Marion, S. C.; and Sentinel, William C. Gunnells, Olar, S. C. Stewart H. Garrett is an Industrial Management major, while the other officers are Agricultural Education majors.

Advisors for the year are Mr. F. E. Kirkley, well-known by agriculturists throughout several states, and Dr. A. K. Jensen, a very friendly recent arrival from Wisconsin State College in Plattville, Wisconsin. Both men are members of the Agricultural Education staff.

ALPHA ZETA WINS REGIONAL AWARD

The South Carolina Chapter of Alpha Zeta held the second semester initiation March 18 at 7 P. M. at the P & A Building auditorium. For outstanding contributions to agriculture in the Southeast, agricultural leadership, and promotion of youth work, Mr. R. H. Garrison, Head, Department of Seed Certification and Dr. W. C. Godley, Professor of Animal Husbandry, were initiated into the fraternity as associate members.

For outstanding scholarship, leadership, and character, the following students were initiated into Alpha Zeta: John M. Bolinger, Pre - Vet; Loren J. Brogden, Horticulture; Maurice E. Feree, Horticulture; J. Thomas Garrett, Horticulture; Francis J. Hanks, Ag. Engineering; Douglas M. Heath, Forestry; Shuler H. Houck, Jr., Dairy Science; Geary C. Jolley, Ag. Education; Lloyd M. Kapp, Dairy Science; Bobby L. Lanford, Forestry; James B. Potts, Jr., Forestry; David B. Rhoad, Ag. Education; Joe F. Shealey, Forestry; Ernest E. Shealey, Biology; Paul L. Stroman, Ag. Engineering; Clarence J. Wheeler, Jr., Pre-Vet.; and James C. Williams, Jr., Dairy Science.

The South Carolina Chapter of Alpha Zeta held its annual Alumni-Student Banquet March 26 at the B&L Cafeteria in Anderson. Dr. H. H. Macaulay, Dean of the Clemson College Graduate School, spoke on "The Aims of Education."

The new officers for the coming year were announced and are as follows; Joe Barnett, Chancellor; Jimmy Palmer, Censor; Bobby Lanford, Scribe; Jimmy Williams, Treasurer; and Jimmy Carter, Chronicler.

The advisory committee for Alpha Zeta will be headed by Dr. W. A. Shain of the Department of Forestry. Other members will be Dr. L. D. Malphrus of the Department of Agricultural Economics, and Mr. B. D. Cloaninger, Head of the Department of Fertilizer Inspection and Analysis.

Receiving top chapter award and a beautiful plaque at the Regional Conclave of Alpha Zeta at the University of Georgia, April 5-6, has climaxed the most successful year in recent history of the South Carolina Chapter. Past chancellor Boling expressed praise for each member, officer, and especially Dr. T. L. Senn and the Faculty Advisory Board for the part each played in the chapter's activity record which placed it above six other competing chapters.

BLOCK AND BRIDLE CLUB ACTIVITIES

The Clemson College Block and Bridle Club held its annual spring barbecue at the Orange-White Intrasquad Football Game, April 6. The barbecue will be served in the Little Gym from 12:00 noon until 2:00 p. m. The menu will consist of hickory smoked barbecue, rice, slaw, pickles, rolls, tea and coffee.

The purpose of the Block & Bridle Club barbecue is to finance trips for judging team members to participate in intercollegiate livestock and meat judging contests. Each year the livestock judging team participates in events in Memphis, Atlanta and Chicago, while the meats judging team enters competition in Baltimore and Chicago.

The Block & Bridle Club held its annual Little International Livestock Judging and Showmanship Contests April 20 near the P & A Building. Future Farmers and 4-H Club members throughout South Carolina participated in the event.

AG ECON CLUB NEWS

The Agricultural Economics Publications Committee has prepared and published the second annual edition of the Ag. Ec Ledger. The Ledger is designed primarily to interest prospective students, both undergraduate and graduates in the opportunities in the expanding fields of agricultural business. Copies have been sent to high schools and Agricultural Economics Departments in the land-grant colleges.

On May 10, the Club held its annual Banquet, with Dr. Max Chapman, President of Lees - MacRae College and an alumnus of Clemson as speaker. At the Banquet it was announced that Vic Bethea, a rising senior from Latta, had been elected president of the Ag Ec Club for the 1963-64 school year. Bethea will also represent the Club in the national student public speaking contest of the American Farm Economic Association at its annual meeting in St. Paul in late August.

DAIRY CLUB

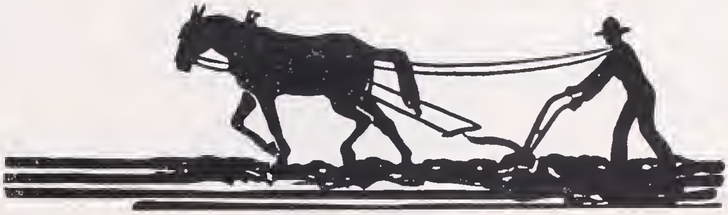
Dairy Club Honors Prof. Goodale

The tribute paid to Prof. Goodale on his recent retirement is perhaps the biggest news from the Dairy Club. At the January meeting he was presented an award in appreciation for his forty years of service to the Clemson Dairy Club. He was the founder and first advisor to the club in the 1920's. The award was the traditional silver "Golden Guernsey Jug." Professor Goodale, completely surprised by the award, was very appreciative.

Also at our January meeting, officers were elected for 1963. Elected were: President--Larry Gause; Vice President--Jon Rogers; and Secretary-Treasurer--Jimmy Williams.

The Clemson Club is very proud to have had two of its members elected to office in the Southern Section of the American Dairy Science Association. At the annual meeting in Memphis, Tennessee, Jon Rogers was elected to serve as President, and Joe Barnett as Second Vice President.

The Dairy Club would like to extend its welcome to Dr. Martin Chalupa who has just joined the staff in the positions of Assistant Dairy Scientist and Assistant Professor of Dairy Science. Dr. Chalupa comes to Clemson from Rutgers University. We are sure he will be a big asset to our department and to the entire college.



AND NOW WHERE?

Editor's Note: Inspection of The Agrarian's past and its future would be incomplete without a look at some shortcomings and possible cures for them. Jere Brittain, a recent past editor of The Agrarian presented the following view points at a meeting of the Student Agricultural Council in February 1963.

An opinion is defined as a belief, stronger than impression, but less strong than positive knowledge. Now in such a sophisticated and scientific age as we fancy ours to be, there is but modicum of positive knowledge. Or, in the vernacular, there's little we know for sure. It may be this is characteristic of an age which could be referred to as Scientific Adolescence.

It is primarily within the present century that we have discovered that knowledge, or science if you choose, possesses a high order of utility. Knowledge in agriculture, for instance, has been plowed generously into our fields, and today we reap harvests of "The Good Life" in the form of warm backs and full bellies. We should scarcely be surprised, in the light of this, to look about ourselves and find that we have accultured and institutionalized science and have in a very real sense become worshippers after her. This Goddess, Knowledge, with her Chief Priest, Technology, seems to be the dominant spirit of our campus, which, I must add, is not unique among land grant colleges of my acquaintance.

Creative Expression..... let us dwell for a time upon this. It is a poorly veiled secret that agricultural students are considered by some elements of this community to be peasants of the literary caste. Perhaps our performance in certain academic areas such as literature has earned us this reputation. But regardless of its derivation, I deeply resent this attitude. And we have at our command the means to rectify it.

For 25 years, with brief interruptions, The Agrarian has voiced the news and opinions of Clemson's student agriculturists. It was once as traditional on Campus as The Tiger. Yet today, perhaps when most urgently needed, our voice has become rather muffled by disinterest.

What are the excuses people give today for their unwillingness to write? These were some which were in circulation a couple of years ago.

"I can't think of a thing to write about."

Anyone with a farm background who takes refuge behind this claim deceives himself. Is anyone nearer to the soul of poetry and philosophy than a boy who sits astride a board fence, watching cows graze a rain refreshened pasture? To have caught a 'possum in the act of chicken thievery is to learn a profound lesson about the struggle for survival. How does impending agricultural legislation effect the folks back in Hampton County?

What is to become of the tenants on the home farm in the face of mechanized and chemical farming? Can you afford to keep them? Or can you get along without them? What can be done to improve the educational effort of The School of Agriculture? You have seen Agricultural Education and Extension at work; What have they done for your farming operation and for South Carolina? Could they do more? Where do Clemson's research funds come from? For what are they spent? Have you seen the current list of Experiment Station Research Projects? What projects would you add to the list? Who is this Professor who teaches you every Tuesday and Thursday at 9? Where'd he go to school? Where was he reared? Does he have a family? Why is he in agriculture anyway?

There's no stopping point, is there?

Another excuse for writer's cramp has been, "I'd 'sorta' be afraid to say what I really think about some of these agricultural questions. It might not do me any good with some of my Prof's."

This argument betrays ignorance of a fundamental ingredient of the democratic process. Since, outside of religious traditions and totalitarian states, no educated person is so bold as to lay claim to ultimate truth, we must exist intellectually in a state of dynamic equilibrium. It is through argument, discussion, re-examination of facts and compromise that logical judgements are derived. In a word, we as "educated agriculturists" are debtors to our fellow man. We owe him our opinion.

"But we simply can't afford much of an Agrarian."

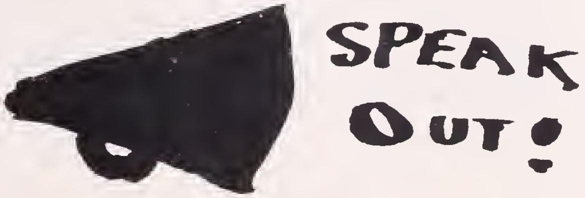
This argument is quite invalid due to the large number of possible sources of money: advertizing, club contributions, student activity funds, assessment of each ag student, alumni contributions, subscription sales, and industrial contributions.

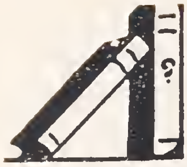
In summary of this point, we are strongly convinced that the limiting factor in support of The Agrarian is enthusiasm - not money.

We suggest a permanent home, well appointed with agricultural classics, droning with typewriters and conversation and smelling of ink and hot coffee. I do not believe the publication will flourish until it again becomes a journalistic fraternity comprised of Agricultural men who share a taste for the communicative arts.

The Agrarian should be published more frequently than twice yearly. A flaming desire to write may flicker and go out during long interims. Furthermore it is difficult, if not impossible, to maintain the interest of a reading audience over such periods. Perhaps a weekly news supplement with bi-monthly feature publications would be attainable.

The Clemson Degree is a credential which is recognized in every by-way of professional agriculture. Let it be our responsibility to continuously upgrade this credential through the proper discharge of our journalistic responsibility. Let us read omnivorously, think with penetration and scope, and arrive at well considered opinions. Then from pen and platform, let us speak!





AGRARIAN PHILOSOPHY

By

The Editor

According to popular concept, the Southeast is only now kicking over the traces of a "one-crop" agricultural system and beginning to develop industrially. In truth, some industrialization was begun in the South in the early 1800's and numbers of animals for agriculture were greater prior to 1860 than since. Unfortunately "King Cotton" did cause many to hold in disdain the possibility and practicality of widespread industry and diversified agriculture, however. That era is perhaps most vividly described by Henry W. Grady, famous Southern orator, in reporting a funeral he attended in his home state of Georgia. He says that the deceased, poor and pitifully dressed, was buried in the midst of a marble quarry, and yet his tombstone was from Vermont. They buried him in the heart of a pine forest, and yet the pine coffin was imported from Cincinnati. They buried him within touch of an iron mine, but the nails in the coffin and iron in the shovel that dug his grave were imported from Pittsburg. When buried, he wore a New York coat, shoes from Boston, breeches from Chicago, and a shirt from St. Louis. The South didn't furnish a thing on the earth for that funeral but the corpse and the hole in the ground.

Fortunately, times and attitudes have changed. The past half century has brought to Southerners the realization of the over-emphasis which has been placed on high returns per acre at the expense of low returns per man hour. This, with advancing automation has had a cumulative effect of producing more and more underemployed farm or rural labor. Today still, the trend is toward fewer but larger, large farms and fewer and smaller, small farms. For every mature farm boy or girl needed to replace farm adults, two are available. A further point is the fact that one farmer in 1820 could produce products for 5 consumers, in 1940 for 10, in 1955 for 20, and today for 26.

Displacement of farm labor and the growing need for industrial labor are seemingly problems which can solve each other. No long ago, agricultural economists at a Southern college predicted that farming within a 15 mile radius of a near-by town could be carried on - and improved - with some 10,000 fewer workers than were then present on the farms in that area. A large chemical company heard the figures, checked them, and shortly erected a plant near that town to employ 6,000. Not only has the plant operated successfully since, but the country about it has experienced new development - new and better conveniences, new churches, revitalized schools and improved homes.

Larger, specialized, and more efficient farms practicing a diverse agricultutal program of an increasing livestock industry, increased utilization of forests, and development of new crop farms such as fruits and vegetables seem to evidently be in the South's near future. Increasing rural industry and manufacturing with uncrowded, non-slum area labor pools of socially and civic-minded persons content and happy in their rural surroundings also seem evident in current trends. Related processing industries, transportation, trades and professions, and recreations along with manufacturing industries and more efficient agriculture can give the South the developing economy it needs. The secret to fullest development of Southern potential, economically and culturally, will be found in full employment under conditions which preserve and develop the best farming practices and the highest type of community life. This may involve some long range plans to provide for the orderly development of our countryside and to prevent costly rural slums in the future.

* * *

The author is indebted to Dr. G. H. Aull, Head of Department of Agricultural Economics and Rural Sociology, for many ideas expressed in this article.

TALL CORN

Young man, don't start worrying about finding your station in life. Somebody is sure to tell you exactly where to get off.

-Farm Journal

Ag. Econ. Prof. - "Eddie, what is a deficit?"

Eddie- "It's what you've got when you haven't got as much as when you had nothing."

COSTLY: Eddie- "Say, what's a buccaneer?"
Freddie- "I'm not sure, but I'd say it's an awful high price to pay for an ear of corn."

Then there's the story of the bowlegged cowgirl who couldn't get her calves together.

The city boy picked up a cockle burr. "Look," he exclaimed, "I've found a porcupine egg!"

Country Constable - "Pardon, miss, but swimming is not allowed in the lake."

City Flapper - "Why didn't you tell me before I undressed?"

Country Constable- "Well, there ain't no law against undressing."

"You down there! "shouted her father from the top of the stairs, "Do you think you can stay all night?"

"Er-er thank you," replied the young lover, "but I'll have to phone home first."

On the whole it is nice to be a gentleman, but it's an awful handicap in an argument.

-Farm Journal

This Spring Semester, 1963, issue of THE AGRARIAN is sponsored by

AMERICAN HUMATES, INC.

manufacturers of fertilizer materials. (See page 13 for results of Clemson research on the effect of humate vs. inorganic fertilizer on sweet potato yield). The staff of THE AGRARIAN wishes to express thanks, in behalf of Clemson Agricultural Students, to American Humates for its generous support and genuine interest in our agricultural publication.

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The Agrarian

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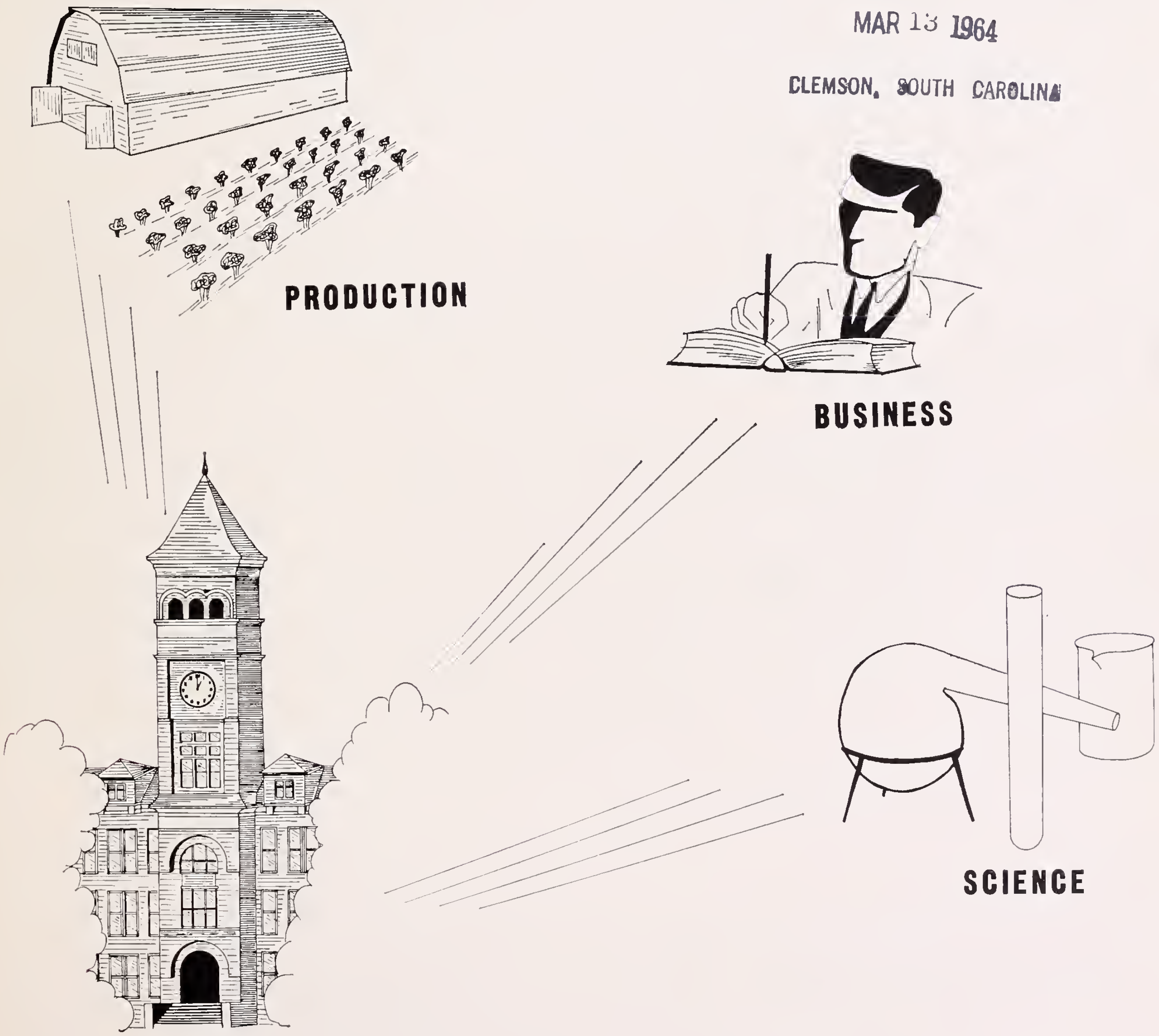

CLEMSON COLLEGE

FALL-WINTER, '63-'64

MEMORANDUM

SUBJECT: Use of potassium nitrate in tobacco fertilizer.

OBSERVATION: It appears that the use of potassium nitrate increases the potassium content of the tobacco leaf, increases yield, and improves the smoking quality of the tobacco.

COMMENTS: Potassium nitrate is highly soluble and readily absorbed by the plant. The nitrate ion is readily assimilated and the potassium ion would probably combine with an organic anion. The potassium organic compound would be less soluble in the plant sap than the potassium nitrate. The lower solubility and the lowered potassium ion concentration in the plant would result in the absorption of a relatively large quantity of potassium.

Where relatively large quantities of chlorine are present in the plant, the potassium chloride would tend to maintain a relatively high potassium ion concentration in the plant sap. The high potassium ion concentration in he plant would tend to lower the intensity of absorption of additional potassium. Increasing the potassium content of the plant without increasing the chlorine should significantly increase the intensity of the absorption of carbon dioxide by the plant.

The increase in the availability of carbon dioxide for photosynthesis could result in higher yields and higher content of sugars and other carbohydrates, which improve the smoking quality of the tobacco leaf.

In wet seasons, and in some poorly drained soils, excess water may exclude soil air, which will result in inadequate soil aeration and a deficiency of available oxygen in the root system of plants. The oxygen in nitrate ions, liberated by reduction reactions within plants, may significantly increase the supply of available atomic oxygen for crop plants, particularly in the root system. A deficiency of oxygen in the root system is often a critical factor in crop production. However, this problem may be corrected by the application of adequate quantities of nitrate nitrogen.

H. P. Cooper

(Dr. H. P. Cooper is retired and was formerly Director of The Clemson (S. C.) Agricultural Experiment Station).

This memorandum is reproduced through the courtesy of Southwest Potash Corporation.

THE AGRARIAN

CLEMSON, SOUTH CAROLINA

FALL-WINTER — '63 - '64
Volume XXI, Number 1

OFFICIAL STUDENT PUBLICATION,
SCHOOL OF AGRICULTURE, CLEMSON COLLEGE

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This magazine is published twice yearly by the undergraduate agriculture students, and coordinated by The Agrarian Staff and the Student Agricultural Council. Opinions expressed in the magazine reflect solely the opinion of the author and do not necessarily reflect the policy of the School of Agriculture or Clemson College.

THE COVER "Three Phases of Agriculture" by Bob Upson. Clemson's Tillman Hall is depicted with lines radiating to these different phases of agriculture.

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AGRARIAN PHILOSOPHY

By The Editor

Agriculture And You

American agriculture has not experienced very many lean years—thanks be to God for this fact! But the blessing of abundance has created what some American taxpayers consider a burden in the form of surpluses. Agreed, the United States Government spends much money for the storage of what is considered excess agricultural products, but other commodities such as medical supplies and war materials are also stored. The foremost question is not the cost of storing such items but whether a reserve of the materials is necessary to the national security.

There is no doubt that in the case of war a reserve of both war materials and medical supplies would be very much appreciated. Another instance in which reserve medical supplies would come in handy would be a widespread epidemic. How about agricultural products? A reserve of agricultural products would also prove beneficial and maybe even necessary for our survival in case of war or epidemic, either of which would take people out of production of food and fiber. Another thing we cannot overlook is the possibility of famine. It seems to me, then, that a reserve of food, fiber, medical and war supplies is a necessity, although a costly one—but could it be that the absence of such a reserve might prove more costly, maybe in terms of human lives rather than dollars?

Perhaps you are interested in some phase of agriculture as a career but are concerned over the fact that Ameircan agriculture is producing over and above our present needs and figure that you may be better off in some other field of endeavor. But if your interest lies in agriculture, please keep in mind that today's level of production will be insufficient rather than too great a few years hence if the present rate of population increase continues. I am not saying we are doomed. The point is that increase in agricultural technology must keep pace with the increase in population if we are to remain well-fed and well-clothed.

The purpose of the foregoing discussion is to say that people are still very definitely needed in agriculture. The staff of **The Agrarian** is of this opinion and is attempting, in this the Fall-Winter '63-'64 issue of **The Agrarian**, to show prospective future agriculturists something about the broad field of agriculture, and to tell those who have come to the conclusion that agriculture is something of the past that there is a place for interested individuals in agriculture.

So if you're interested in agriculture, wade right in and I'm sure you'll find, in either the production, business or scientific phase of agriculture, a place of service which will give you the satisfaction of a job well done and a life usefully lived.

Yesterday, Today And Tomorrow

The Agrarian was born in 1938 and grew through much sweat and toil into a B.P.O.C. (big publication on campus). As with many quality publications, however, **The Agrarian** spent, in the quest of a bigger and better magazine, more money than was economically wise. Thus it was that in 1958 **The Agrarian** ceased publication because of financial difficulties.

In the fall of 1960, however, under the leadership of the vitalistic Jere A. Brittain, **The Agrarian** again appeared on the Clemson campus. Jere and his staff and the staffs following are to be commended for the valuable service which they have rendered. Last year Jerry Moore campaigned for a return to a slick type publication, but, much to his disappointment, the money was just not to be had. Jerry's effort proved far from being a failure, however, as he instilled into the present staff his ideas and opinions, and as a result the present issue of **The Agrarian** marks the first slick issue since the 1958 difficulties.

Recognition should be given to Jimmy Williams, Charles Josey, Jimmy Palmer and Dr. J. T. Lazar for their hours of concentrated effort in securing funds through sale of advertisements, and for the management of business affairs in making possible this issue of **The Agrarian.** Other students worked willingly in trying to secure funds but were unsuccessful in their attempts. To them we also express our appreciation for their effort. Various departmental student clubs contributed funds from their already deficient supplies, and to these we express our gratitude.

If you have an occasion to so do, please patronize our advertisers as they paid dearly for the ads you see in this magazine in order to help us get into a more sound financial condition. Good news! The financial picture is looking bright; there is even talk among the staff of lowering advertisement rates next year!

The Agrarian has a hard working crew on the staff this year which has kept things running smoothly. Clubs have also been cooperative in getting articles in (some even on time). All in all, participation has been very good with this issue. But how about next year? In order that **The Agrarian** may continue on the incline, all interested students are invited to attend our meetings and observe our operation as we in turn observe you. Then sometime during second semester, next year's staff will be chosen. Do you think you can benefit **The Agrarian?** I think it has something to contribute to you if you are willing to work with it.

WHAT IS AGRICULTURE?

By Dr. J. W. Jones
Director of Agricultural Teaching

Is agriculture a science? Yes, it is a broad and complex science, primarily an applied one involving food, clothing, and shelter—the necessities of life.

Is agriculture a business? Yes, the nation's biggest.

Is agriculture an art? Yes, many skills are required in the production and marketing of farm products.

Modern agriculture is, therefore, the science, business, and art of producing, processing, distributing, and utilizing plant and animal products, including those aspects of economic and human relations related to these activities.

About 21 million people in this country are in jobs related to agriculture—one-third of the nation's total employment.

Five million people are engaged in farming —the production of food and fiber. This is equal to the combined employment in transportation, public utilities, the steel industry, and the automobile industry. The efficiency of the American farmer has increased tremendously. In 1940 one farm worker produced enough for himself and 10 others. Today he produces enough for himself and 26 others. One hour's work will purchase more food today than it did 30 years ago.

Six milion people provide supplies and services for the farmer. Each year farmers spend about 27 billion dollars for goods and services to produce their products. These expenditures include 3.5 billion dollars for fuel, lubricants, and machinery maintenance. Farming requires more petroleum than any other single industry.

Ten million people are employed in the storing, transporting, processing, and merchandising of agricultural products. The meat and poultry industry, for instance, employs 300,000 people and has an annual payroll of approximately 1.5 billion dollars.

Since all segments of agriculture, including farming, are rapidly becoming more complex, they require employees with higher levels of education. This means that a greater proportion of workers in this industry need a college education. The demand for college agricultural graduates is increasing. According to a recent national study, about 15,000 agricultural graduates are need each year. Our land-grant colleges, such as Clemson, are now graduating about one-half this number.

What subject matter makes agriculture a unique area in education? There must be some good solid reason for the long-time existence of schools and colleges of agriculture. Otherwise, the responsibility for educating future workers for this basic industry could be assigned to other segments of the institution. Agriculture is a unique area in education because it applies the basic and organizational sciences to biological material for economic implications. This is the irreducible core of subject matter that is agriculture.

Because of the increasing complexity and diversity of agriculture, it has become impossible to cover adequately all of its important facets in a four-year undergraduate curriculum. As a result, the Clemson School of Agriculture has established options in science, business, and production technology in several of its curricula. These options make it possible for the student to emphasize the facet of subject matter that will best prepare him for his chosen career.

The undergraduate curricula available in the School of Agriculture include agricultural economics, agricultural education, agricultural engineering (jointly administered by the Schools of Agriculture and Engineering), agronomy, animal science, dairy science, entomology, food technology, forestry, horticulture (fruit and vegetable, and ornamental), poultry science, and pre-veterinary medicine. The biology curriculum with options in botany and zoology is also administered by the School of Agriculture.

Senior (at a football game)—"See that big substitute down there playing quarterback? I think he's going to be our best man next year."

Coed: "Oh, darling, this is so sudden."

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Surpluses—A Blessing In Disguise

By Gene W. Dukes, Ag. Ec.

Americans today are faced with a very unique problem—the problem of farm surpluses. A large percentage of the world population today lives in the constant fear of hunger, while we in America are constantly seeking methods to solve a problem created by overabundance. The fact that our government had 5.3 billion dollars (as of December 31, 1961) tied up in what many regard as unneeded stocks of storable farm products is frustrating to taxpayers, worrisome to officials, and puzzling to the general public.

The so called problem of farm surpluses is given much coverage by newspaper editorials, legislative reports, and almost every type of news media in the United States. Many people seem to think that this problem, if not liquidated, could prove detrimental to our economy as a whole.

Our economy, however, hasn't always been faced with such a unique problem; instead, during the earlier periods of our economy the reverse of this situation occurred. General Washington had no farm surpluses to draw upon when his army faced hunger during the bitter winter of 1776. During this period, most farmers had to devote all of their time to the feeding of their own families, while today one farmer can feed 26 other people and still find ample time for relaxation.

How has agriculture become so dynamic? Is it because a larger percentage of people now farm? No—the farm population has dwindled from almost 100% of the total population during the period before and after the Revolutionary War to only about 7.7% of the total today. Is it because more resources are being utilized? No, the acreage of land in production has stood fairly stable over the past years. Certainly the amount of labor put into agriculture has nothing to do with this great increase in production, because man hours devoted to agriculture have actually been decreasing with time.

What has caused the boom in production? There is no one sentence answer to this question. There have been many contributions to agriculture from within the agricultural population and from outsiders. Farm machinery companies have developed machines which enable the farmer to plant and harvest efficiently. Agricultural scientists have developed new varieties and improved old varieties of different crops to increase output. The increase in knowledge of the different nutrients that plants need to grow and the proper adjustments in the fertilizer industry have had beneficial results. If I had to designate one phase which has contributed most to this tremendous increase in output capacity of the American farmer I would place emphasis on the increase in the managerial ability of the farmer.

The American farmer today is a businessman in all respects. He is motivated by profits, and spends many hours reviewing his facilities at hand in an effort to increase his profits. He considers the returns from which he could get from allocating his resources among different crops and means, and chooses the one he considers the most beneficial to his entire farming program. The American farmer has learned to use credit in the planning and expanding of his farm program. In the past the farmer was dreadfully afraid of debts and foreclosures, but through the example set by industry, and the improvements in the lending programs to farmers, he has changed his attitude and now seems to regard credit as an essential means of increasing production.

The American farmer has learned to incorporate new techniques of production into his farming program, he has pushed specialization to a peak, and has built up stores of capital equipment which are necessary for an efficient operation.

Surpluses are the result of the ability of the American farmer to adapt to the most improved methods of increasing output. Our population has increased from just a few million during the early days of our country to about 183 million today, but instead of the farmer keeping in step with the population growth he has stridden ahead of it.

Experts say our population should reach 200 million by 1975, and even with the great advances of knowledge, scientists probably will never find anything to really take the place of food. So our population will keep on buying bread, milk, meats of all sorts, vegetables, and all varieties of our present food supply in greater quantities than ever before. The resources of the American farmer are not unlimited. There is just so much more land that can be put into production, so this increase in demand is going to have to be met by still further improvements in the operation of the farm. Whether the farmer meets this increased demand is going to depend upon whether or not he can sort out the new techniques and plug them into his operation in such a way that he will profit by them.

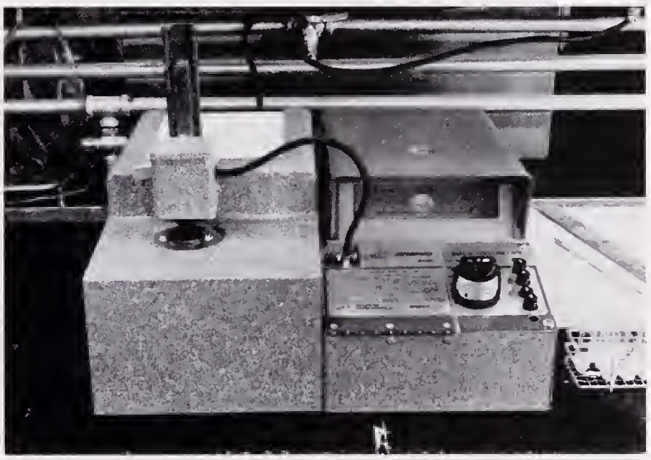
Surpluses, then, should give the people of America a feeling of security. Even though they do represent a touchy problem, they also represent the advances of agricultural production. Surpluses show that the farmer is progressive, that if it is possible he will increase production with time, so that future generations of Americans will have a bountiful quantity and quality of all sorts of agricultural products.

Science Assures Quality Milk

By Spann Brabham and James McMillan, Dy. Sci.

Much time, labor, and money is spent by federal, state and local governments for scientific research and development dealing with methods and processes for assuring the consumer a wholesome and plentiful supply of milk and dairy products. Science plays an important role in making and keeping milk the purest food in the American diet.

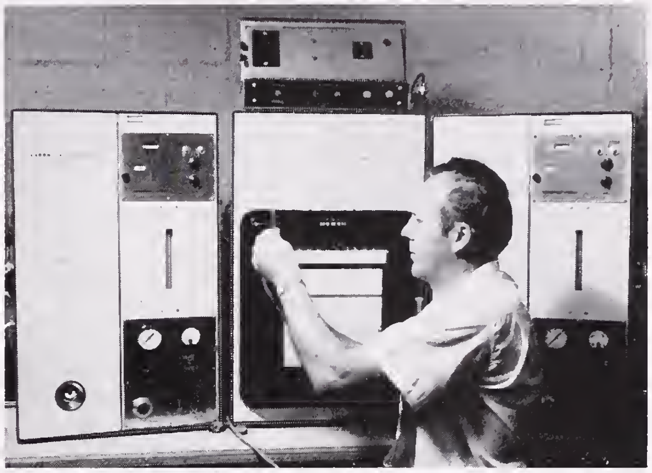
Methods for the determination of the freezing point of milk have been developed to prevent the adulteration of milk by "added" water at production and processing levels. Accurate butterfat and total solids methods are constantly employed to assure that milk and other dairy products meet quality established by state and federal authorities. Bacteriological assays are made to determine the milk's sanitary quality. Methods based on the presence or absence of enzymes are used to insure that all milk is properly pasteurized.



Cryoscope equipped with thermistor sensing element and digital readout and used for measurement of the freezing point value of milk, one of the physical properties of milk associated with milk quality.

Most of these methods and processes have been developed in colleges of agriculture and state experiment stations located throughout the United States. With the passage of the Morrill Act which initiated the establishment of the land-grant colleges, a place was provided for the research and development needed to make the United States dairy industry second to none in the world. In these colleges reside departments of dairy science in which scientists, specializing in biochemistry, bacteriology and other related subjects, strive to improve the quality and consumer acceptability of milk and other dairy products.

Serious flavor defects may be found in milk. Most of these flavors originate during processing or distribution, but there are a few that develop at the production level. Research has shown that consumers prefer the same flavor in milk from day to day although it is seldom produced with uniform flavor by the cow. Flavor defects have been studied, in many dairy science research laboratories and methods have been devised to eliminate them. The vacuum pasteurizer was developed to remove most fat-soluble off-flavors from milk and to "standardize" milk flavor from day to day. Rancidity is the only off-flavor that gives the milk industry a great deal of trouble today, and through scientific research, its occurrence is being rapidly eliminated.



Vapor fractometers, recorders and integrator, used in the identification of flavor compounds in milk.

The dairy industry is the only industry that has "zero" tolerance for drugs. Absolutely no drug residues can be present in milk. Penicillin is the drug that is of primary interest to the dairy industry, because a few people have allergic reactions to it. Penicillin is used in the treatment of bovine mastitis—an irritation of the mamary system in dairy cattle, as in humans. The treated animal's milk must be disposed of for a certain length of time after treatment. Milk found to contain drugs of any kind is prohibited from entering distribution channels.

The freezing point determination has given the milk plant a very efficient method of checking for adulteration of milk by "added" water. The addition of water to milk at either the production or processing level is not permitted by either state or federal authorities. This is one of the measures in quality control of milk. The freezing point value of milk has been found to be affected by vacuum pasteurization in much the same way as by the addition of water. This presented a major problem between the milk plant and the producer until science revealed the answer. It was found that vacuum pasteurization raises the freezing point of milk 0.0055°C., equivalent to one percent "added" water. No water has been added but soluble gases have been removed making it appear that water was added.

Milk, like other food products, is a good medium for the growth and multiplication of patho-

(Continued On Page Seven)

THE CASE FOR VOCATIONAL AGRICULTURE

By Jim Ballington, Ag. Ed.

Is vocational agriculture in the high schools important?

Approximately 8-10 per cent of the total population of the United States today is engaged in agricultural production and the present trend is for the percentage to keep decreasing. This gives each farmer the responsibility of feeding more people than ever before. In addition to these engaged directly in agriculture, approximately another 30 per cent of the U. S. population is engaged in the total industry of agriculture. This total industry includes, in addition to production, marketing, processing, and services to the farmer. At least 2 workers in off-farm agriculture will be needed to supply and service each farmer and process and market his products. All these are jobs in which a knowledge of basic agricultural principles is essential or highly desirable.

Although the number of farm operators is decreasing, the number of workers per farm is steadily increasing. In South Carolina the total number of farm workers has increased from 12,790 in 1954 to 17,142 in 1959. This is an increase of 34% for the five year period. This represents additional regular employment opportunities for nearly a thousand agriculturally trained persons per year plus replacements for these workers.

Not only the number of workers is increasing but the quality of workers desired is going up. The hired workers must, in addition to being able to operate and maintain modern farm machinery, have a basic knowledge of scientific farming methods. Today many states are faced with the problem of a surplus of farm laborers and a shortage of the type of skilled, well-trained farm workers needed on modern farms.

The fact that the majority of farm workers today are relatively untrained and unskilled in good measure explains the difference in average wages between farm workers and workers in other industries.

The average age of farmers in South Carolina is about 50 years. It is estimated that 2,400 persons will be needed annually to replace the farmers who retire, die, or quit. At present about 4,800 farm boys reach maturity in South Carolina each year, meaning there are farm operators' jobs for about half of the boys who grow up on South Carolina farms.

So, again the question, is vocational agriculture important? Today's farmer must keep abreast of new technology and production methods to perform his job efficiently. Since the majority of the young men going into farming today do not attend college, where will they get the training necessary to become successful farmers? Training high school students in basic agriculture is more important now than ever before. What of the non-farm agricultural worker? Again vocational agriculture is one of the answers to providing the necessary training or providing the background for training many of these workers.

The Block And Bridle Club News

By Jim Heselbarth

This fall the Clemson College Livestock Judging team, coached by Professor Dale L. Handlin and sponsored by the Block and Bridle Club, has participated in two intercollegiate judging contests.

On September 21, the team competed in the Mid-South Fair in Memphis, Tennessee. After the contest the team was treated to a rodeo and a banquet. Wayne Long placed fourth high individual in the contest.

On October 2, the Judging team participated in the Southeastern Fair Judging Contest in Atlanta, Georgia. Clemson placed third out of eleven with Tillman Mathias third high individual and Wayne Long tenth high individual. The team was the number one team judging hogs.

Members of the team who took the trips are: Tillman Mathias, Wayne Long, Clyde Wehunt, Bill Howell, Jim Heselbarth, and Hubie Waldrop. In November, the Meats Judging team took part in judging contests in Baltimore, Maryland, and Madison, Wisconsin.

The Block and Bridle Club held its annual fall bar-b-que at the Clemson - Georgia football game on October 12. Each year the club sponsors a fall and a spring bar-b-que to finance the activities of the club. Primary activities of the club include sponsoring trips for the livestock and meats judging teams and sponsoring the Clemson College Little International Livestock Showmanship and Judging Contest.

To study the migratory habits of birds, a government agent released thousands banded with metal strips, reading, "Notify Fish and Wildlife Division, Wash, Biol, Serv." They soon heard from a North Georgia farmer. "Gents, I shot one of your crows last week and followed the instruction attached to it. I washed it, biled it, and served it and it sho was awful."

Food Supply—Imperial Style

By Jeff Denit and Jake Joye
(Student Branch—A.S.A.E.)

Imperial Valley, California is now famous. What was once called the Colorado Desert, a dry, parched region of famine, is presently a half-million acre, "open-air" greenhouse. How this came about is a wonder to agricultural scientists the world over.

At the turn of the century the old Colorado Desert was, at best, bone dry. A paltry three inches of rain fell annually and this evaporated almost as it fell. But a group of speculative promoters organized a company and built a canal to irrigate the valley with water from the great Colorado River. Hundreds of settlers, sensing the potential of the area, flowed into the valley. In 1901 the canal was opened. But, even though the land was now productive, the greatest enemy of all desert irrigation, salt poisoning, waited for the conditions wherein ruin and waste would once again cover the newly-formed farmsteads.

To explain this problem: In areas with high annual rainfall leaching actually benefits the land by carrying the salt compounds to rivers which, in turn, deposit the salt in the ocean. In arid areas the high temperatures cause rapid evaporation and **upward** movement of the water through the topsoil. The net result is that the salt compounds, normally leached away, are pulled to the plant root zone and cause ultimate death. Many millions of acres of the fine land in the Middle East have been abandoned for this very reason.

By 1920 the Imperial Valley was also being abandoned—the ravages of salt poisoning were prevalent.

This devastation led to the initiation of one of the most expensive and thorough research projects ever launched. Federal and state agencies and universities in this arid region united to find a solution.

After many years of arduous research they found the answer. A 32 million dollar drainage system was installed six feet below the soil surface. With 9,500 miles of tile drains, the valley literally flushes itself as you would an automobile radiator after the winter season. Irrigation water comes in on the surface and the drains remove it along with the salt well below the tender root zones of the plants. Two 100-car freight trains of salt are dumped into a basin at the northern end of the valley each day!

Now, some forty years after the valley seemed doomed, it is one of the richest, most productive areas in the world. Its growth media is topsoil which was deposited by the Colorado River over millions of years. In some places this topsoil reaches a depth of two miles! This valley has an almost ideal climate with 365 days of sunshine and only an occasional light frost. Each year the valley produces 549,000 head of cattle from 172 feedlots, 28 million dollars worth of lettuce, one-third of the nation's carrots and cabbage in January and February, along with a 3.6 bale-per-acre cotton crop.

From land which was worthless, the Valley is now valued at $1,000 to $1,500 per acre. The Imperial Valley with its rich soil and miles of green vegetation is truly a monument to engineering in agriculture.

Science Assures Quality Milk

(Continued From Page Five)

genic bacteria. There are many precautions taken today to assure the public that milk is one of the safest foods in the national diet. The development and use of the pasteurization process makes certain, if present, that all pathogenic bacteria will be destroyed before the milk is marketed although the development and maintenance of disease - free herds, with annual or biannual checks for diseases such as tuberculosis and brucellosis, makes their presence extremely unlikely. At regular intervals a check is made for efficient pasteurization by testing for the enzyme phosphatase. Research has revealed that both this enzyme and pathogenic bacteria are destroyed by efficient pasteurization, so a test for phosphatase will determine whether or not pasteurization is complete and milk is "super-safe."

The dairy industry is the most regulated and inspected food industry in the world because of the importance of dairy products in the diet of all age groups. Milk is the only beverage that is classed as a food. Because of scientific research and development, consumers receive the purest, most wholesome, and finest quality foods in their diet from milk and milk products. These safe, pure, and wholesome foods represent to the consumer a return for the time, labor and money invested which is unequalled in any other segment of the food industry.

"Mother, are there any sky scrapers in Heaven?"

"No, son, engineers build sky scrapers."

A patient at a mental hospital who had been certified cured was saying good-bye to the head psychiatrist.

"And what are you going to do when you get out in the world?" asked the doctor.

"Well, I may go back to A&M and finish my chemical engineering course. Then, I liked the Army, so I may enlist again."

He paused a moment and thought. "Then, again, I may be a teakettle."

COEDS IN AGRICULTURE

By Bill Whitfield, Feature Staff

The number of coeds at Clemson has been increasing in recent years. Presently, there are 150 coeds enrolled in various curriculums at Clemson. Due to the recent construction of housing for women students. the number of coeds at Clemson is expected to increase at a much greater rate in the future.

There are eleven coeds in the School of Agriculture, with academic endeavors in the major fields of Dairy Science, Horticulture, Food-Technology, and Pre-Veterinary Medicine.

The new women's dormitory

Dairy Science is composed of selected studies of fundamental and technical nature superimposed upon required basic science core of the Dairy Science curriculum. It enables students to acquire the perspective, understanding and proficiency necessary to enter a demanding, rewarding and respected industry. Occupational opportunities for Dairy Science graduates include management of production and processing facilities, teaching, research, extension work, quality control work for processing units and production organizations, public health services, industrial promotion and public relations work in both production and processing fields, dairy and food products engineering, and special services and educational work in non-institutional fields.

Dixie Marion from Cedartown, Georgia chose the Dairy Science curriculum, while Elizabeth Hamlin from Charleston, South Carolina chose Ornamental Horticulture as her major. Elizabeth plans to pursue the field of landscape design after graduation.

The Ornamental Horticulture curriculum is designed to give students a scientific background and technical facilities in the field of ornamental horticulture. Graduates find careers in nursery work, floriculture, landscape contracting, turf management, and park supervision.

Dona Hallum from Liberty, South Carolina is in the field of Food Technology. Dona plans after graduation to do graduate work in either Food Technology or English. Susan Boulware from Arlington, Virginia is also a Food Technology major.

The food processing industry is the nation's largest industry. The curriculum in Food Technology provides an excellent education designed to prepare graduates for occupations in the food industry, research positions in government organizations and state experiment stations, food inspection, grading work with state and federal agencies, teaching, extension, and consulting opportunities.

The curriculum in Pre-Veterinary Medicine is designed to meet general requirements of certain schools of veterinary medicine. The Pre-Veterinary curriculum at Clemson specifically meets the entrance requirements of the School of Veterinary Medicine at the University of Georgia. This curriculum is based on a four semester program at Clemson. There are seven coeds at Clemson in this curriculum. These include Martha Jacks from Simpsonville; Joan Le Mire from Greenville; Barbara Atkins from Greenville; Romana Biejenski from Jackson Heights, New York; Mary Williams from Monks Corner; Cheryl Truesdale from Camden; and Susan Jumper from Hampton.

The eleven girls mentioned above chose the field of Agriculture because of their desire to be of service to mankind and to be a part of this ever growing and much essential industry in the United States. Coeds have a place at Clemson. The field of agriculture offers good educational and occupational opportunities. Regardless of your interest, Agriculture has a place for you! Think it over before you make your choice. If you have an agricultural background and an interest in one of the three areas of Agriculture—science, business, and production—you should seriously consider making Agriculture a part of your life.

The Last Straw. A fortunate young man in New Hampshire proudly showed friends this glowing love letter from his old girl, Susan: "Dear John: I have been unable to sleep ever since I broke our engagement. Won't you forget and forgive? Your absence leaves a void nobody else can ever fill. I love you, I love you, I love you. Your adoring Susan.

"P.S. Congratulations on winning the Irish Sweepstakes."

"Oh! dear, I've missed you so much"—then she raised the revolver and tried again.

"Is your girl spoiled?"

"No, it's just the perfume she's wearing."

AGRONOMY?

By Jimmy Carter, Agron.

The science which deals with crop production—this is a general definition of agronomy. Agronomists are responsible for the production of good, healthy crops.

Soil scientists and plant physiologists determine the needs of the plant and the ability of the soil to fulfill these needs. They tell the farmer how much he must feed his crop, whether or not he must "sweeten" his soil and the amount of extra water the plant will need on this soil.

New and better varieties of corn have been developed by agronomists as well as direct contributions to man and his health by discoveries such as Dr. Waksman's.

Geneticists are busy developing new varieties of crop plants which will produce more "fruit" with a given amount of labor and fertilizer. Research has also given rise to plants which can withstand extremely dry conditions and diseases.

So we see, the agronomist is necessary for our food, and fiber needs. However, agronomists have also made more direct contributions to mankind. Waksman, who came to this country from Russia in 1910 at the age of 22, is a soil scientist well known for his work with microorganisms and their therapeutic value. In 1952, he and two of his coworkers received the Nobel Prize in medicine for the discovery of streptomycin. They isolated a streptomycin-producing strain of microorganism. This strain was obtained from the throat of a chicken and also from a heavily manured field soil. Many infections which did not previously lend themselves to any form of therapy were controlled by this new "wonder drug." Tuberculosis in animals, for instance, was controlled in early experiments with streptomycin. This suggested that an agent had finally been found which could be used effectively against this dread disease in man!

Dr. Waksman's contributions represent only one of the many things which scientists in the field of agronomy have done. Today, with modern research tools, great advancements are being made in pure science and in the application of new principles to agriculture which will increase the efficiency of farming. As more land is used for highways, industry and cities, the ability of the farmer to produce enough to supply a bulging population will represent a major factor in the struggle of the United States for survival—and the agronomist must be beside the farmer, still lending a helping hand.

The Clemson College Forestry Club

By Danny Lamb

Every second and fourth Tuesday night, members of the Clemson College Forestry Club converge in our elaborate clubroom (complete with bar "Pepsi Cola") to be entertained by interesting speakers and films dealing with all phases of forestry.

The forestry club, always guided by spirited leadership, keeps on the move with its activities and projects throughout the school year. Last year, our club was the host for the regional conclave of southern forestry schools. Three hundred forestry students from eleven forestry schools in the southeast were on our campus for a weekend of activities in which the students displayed their skills and knowledge of forestry. This year our club travels to Oklahoma A. & M. for the regional conclave.

The most recent project of the club is "Operation Firewood." In order to raise the necessary funds to send our club to Oklahoma, we have been cutting firewood on weekends and selling it to the local people. After several weeks now, we are again operating in the black.

The forestry club always has an interesting and winning homecoming display and this year we are planning a "drop in" for members and their dates.

The highlight of each semester is the club's "cook-out" at Lake Issaqueena. More than one tired but smiling face is seen at the annual barbecue, climaxed by the initiation of new members, draws to a close. But once it's over, all initiates become members in one of Clemson's most active clubs—THE CLEMSON COLLEGE FORESTRY CLUB.

Words to the Wise

A young man was graduated from college, and ran out shouting to the world: "I've got an A.B.! I've got an A.B.!"

"Sit down," said the world, "and we'll teach you the rest of the alphabet."

MEAT FOR THE FUTURE

By Kenneth K. McDaniel, Animal Science

In the year 2000, the population of the United States will have doubled the 1960 population. As students of today and businessmen of tomorrow, we will be responsible for feeding this multitude of humanity. This will be possible through ever-growing scientific research and development, improved practical application, and more effective administration.

Livestock farming is a large and expanding industry. The livestock farmer must produce the type of meat suitable to each and every consumer. As animal scientists we must meet the ever-changing needs of the future. We must produce an animal which supplies higher quality meat with less fat and more lean. This animal must make faster, more efficient gains and have the ability to pass these traits onto its offspring. Our goal is to produce more meat of a higher quality for a growing population. We can help accomplish this goal through such animal programs as the use of purebred sires, performance testing, and swine certification. These programs provide important tools for a breeder to use in adapting most quickly his present day animals to the constantly changing performance demands as dictated by consumer demands.

Perhaps you feel you are better adapted to other phases of the agriculture industry. The animal scientist needs assistance from other fields in order to meet the demands of the future. We must work with the geneticist to improve breeding. The assistance of the agronomist is needed to produce improved pastures and crops. The veterinarian is needed for his help in preventing diseases and improving management. The entomologist is a great aid in reducing insect and parasite loss. The extension workers teach the basic principles of management and provide producers with new ideas. The agricultural engineer develops new equipment and better units to fit specific situations. The chemist aids in feeding, digestion, and pharmaceutical problems. With the assistance of all these workers and many more, the animal scientist can produce a better suited animal for the increased needs of the future.

You can fit into this picture. There is a po-

(Continued On Page Eleven)

THE "MOLECULAR HOE"

By Bill Morrison and Jim Trautner, Biol. Sci.

"Praise the Lord and give us the 2,4-D" might well be the call of the progressive American farmer today. 2,4-D happened to be the first of an ever-increasing number of chemical agents used in selective weed control. Dr. Willard B. Albert, who has been with the Department of Botany and Bacteriology at Clemson College since 1926, can vividly recall his father using salt in eliminating weeds from his fields nearly a half century ago. Crude methods such as using salt were an expression of man's desire to find more efficient means to control weeds.

According to Dr. Albert, the break-through in chemical weed control came right after World War II. Following the introduction of 2,4-D in 1944, there was a phenomenal growth in production of selective herbicides by the chemical industry of the United States. Dr. Albert's own work with selective herbicides has been carried on extensively for the past 18 years with remarkable results. Dr. Albert, a plant physiologist-agronomist, evaluates promising chemicals for weed control in such field crops as corn, cotton, soybeans, sweet potatoes, alfalfa, and pastures in South Carolina.

What are some of the problems facing scientists such as Dr. Albert in selecting chemicals as useful herbicides? Most important of all, the chemical must not leave residues on the crop or in the soil that might be harmful to succeeding crops, or to man and animals that utilize these crops for food. Crop tolerance is another problem taken into consideration—the chemical must destroy weeds but not harm the crop. Also, effectiveness of herbicides has been found to vary with such conditions as temperature, soil types, and rainfall. For example, the chemical CIPC works well in relatively large quantities in the Spring, whereas in the Winter when soils are cooler smaller quantities of the chemical are used to reduce toxicity to the crop. Dr. Albert carries on his research at three experiment stations with varying soil types: Clemson (sandy clay), Edisto at Blackville (sandy loam), and Pee Dee at Florence (fine sandy loam). As a result, it has been found that perhaps only one out of ten prospective chemicals tested is of any significant value for practical use in weed control.

What is the real significance of this research? Weeds cause losses of millions of dollars to agriculture in the United State because they reduce yields, lower the quality of the crops grown, and prevent the efficient use of land. The "hoe-bill" (i.e., the cost of cleaning by hand weeding) for an acre of cotton may range from ten to sixty dollars. When chemicals are not utilized for weed control, cotton must sometimes be hoed three or four times in one growing season. Chemical weeding can be done for three dollars per acre and will eliminate 80 to 90 per cent of this hoeing.

The significance of chemical weed control is also felt outside of agricultural areas. Weeds must be controlled on railroad and power line right-of-ways. The homeowner is constantly at war with them in his lawn, shrubbery, and play areas. Aquatic weeds clog up drainage ditches and interfere with swimming, boating, and fishing in our rivers and lakes.

Weed control is indeed big business. Plant researchers such as Dr. Willard B. Albert of Clemson College Department of Botany and Bacteriology are really the backbone of this great industry which is now having, and will continue to have, profound effects on our economy. It is they who seek out the values of new chemicals and recommend their application as weed controlling agents. Man has at his disposal a new and increasingly important tool, the "molecular hoe."

Meat For The Future

(Continued From Page Ten)

sition waiting for you either in the field of animal science or some other phase of agriculture. There are job positions open to both men and women in the production, business, and science phases of agriculture. The choice is wide and the opportunity is great.

Animal science is a wide field awaiting you. Livestock production coupled with our entire agriculture industry is the key to a successful nation's economy. Meat is a miracle. Today meat offers more quality, and more taste-tempting variety; yet it is taking a smaller part of our income. It takes fewer people to produce more meat today than ever before. The future of any industry grows out of the present, just as the present has grown out of the past. You can be a part of this great future in the livestock industry. You can help us feed the multitude of humanity in the years to come. If you understand our objective and can work hard to achieve that goal, then choose the livestock and agriculture industry. You will be richly rewarded.

"What's the matter?" asked the girl.

"We're out of gas," replied the boy. "We may be here quite a while."

The girl smiled shyly as she took a bottle from her bag and said softly, "We can make good use of this, then."

"Great," said the boy with a pleased grin. "Is it gin or whiskey?"

"Neither," she smiled, "it's Ethyl. I've been out with you Clemson men before."

Who was the smartest inventor? Edison. He invented the phonograph so people would stay up at night and use his electric lights.

Three Phases Of Agriculture

By John D. Ridley, Feature Staff

Agriculture today is different from the agriculture of yesterday. The word agriculture in the past seems to have meant working in the field and actually getting down to the pain striving labor to produce some agricultural product. Today the word agriculture has taken on a new meaning, and we have a new look toward the field.

The School of Agriculture at Clemson has taken a look toward the future in breaking the field down into three branches. Clemson stresses the science, business, and production-technology options in agriculture. The School administrators recognize that modern agriculture is a complex industry. We have a half million scientists directly or indirectly concerned with agriculture today. The "new" agriculture includes more than scientists, however. About six million people produce items that are utilized by the farmer, and ten million people process and distribute farm products. All totaled, approximately one third of all jobs are related to agriculture. This shows us the importance of workers in agriculture to the survival of man.

The choice of option is left to the student, but if he chooses the science field, he will place emphases on the basic sciences that prepare students to contribute to the advancement of knowledge in their respective fields. This course of study is designed for students whose future work requires considerable scientific training and usually graduate studies. Employment opportunities include research with State Agricultural Experiment Stations, the United States Department of Agriculture, and industrial and commercial organizations; and teaching in colleges of agriculture, and other educational work with Federal, State and industrial organizations.

The student who makes the choice of the business option has the responsibility of working with one of the many businesses and industries that provide supplies and services for the farmer, and process and distribute farm products. There are many opportunities in employment. They include work related to meat and poultry processing, sales and service of farm machinery, manufacturing and sales of fertilizers and pesticides, dairy and food processing, grain and seed processing, feed manufacturing, banking and credit, insurance, farm management, land appraising, and the marketing of agricultural commodities.

The production technology field emphasizes the application of scientific principles to agricultural production. A student in this field must have a broad general knowledge and training in scientific and practical agriculture. Some of the employment opportunities include general and specialized farming; agricultural extension services; teaching vocational agriculture, conservation of natural resources; agricultural communications; and agricultural services of the United States Department of Agriculture, State Departments of Agriculture, and private enterprises.

Into which of the three phases of agriculture do you best fit—science, business or production technology?

ASAE NEWS

By Jeff Denit

The first meeting of ASAE was devoted to planning the groundwork for this year's program. Financial projects, Homecoming participation, and administrative details were handled. Also, during this meeting, recognition for Clemson's activity in the Farm Equipment Institute competition was noted. This competition consists of presenting a review of club activities to a judging board which selects the top clubs in the nation. Clemson won third place in the Class B, or smaller club membership, competition.

This semester's initiation program was carried out during the week of October 16. Four new members were inducted bringing club membership to eighteen.

ASAS is looking forward to a fine year. Banquets and guest speakers are planned to provide enjoyment and education to all faculty staff and student members.

COBURG

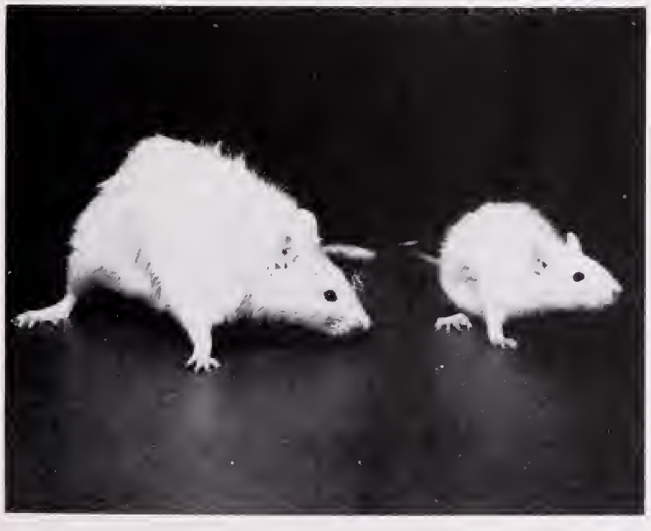
BETTER THAN
IT HAS TO BE !

CAN DIETING AFFECT AGING

By Dona E. Hallum, Food Tech.

Six years ago, the Department of Food Technology and Human Nutrition was inaugurated at Clemson. The purpose was primarily to conduct research leading to improved food products and better public nutrition. More recently, an undergraduate teaching curriculum has been adopted in the department and is in its second year of operation. The department now has twelve major research projects in progress. Intensive investigations are proceeding in such areas as: the nutritional aspects of sesame meal; the development and improvement of poultry products; the function of vitamin E in lipid metabolism; the causes of nutritional muscular dystrophy; improvement in the amino acid composition of corn protein; the biochemical factors affecting peach texture; and the nutritional quality of vended foods in industrial plants. Thus the research is concerned largely with obtaining basic information leading to increased utilization of South Carolina agricultural products for food purposes and the improvement of the basic nutrition of people generally. In the latter field especially, where research is in the realm of animal and human nutrition, the results come slowly but are far-reaching.

One of the department projects concerns the influence of amino acid supplementation on growth rate. It has been noted by adjusting the proportions of certain amino acids in the diet that the growth of rats was partially suspended for a period of six weeks. How is the phenomenon of partial growth suspension brought about? A basic protein source is supplemented with prescribed levels of crystalline amino acids. High levels of supplementation gave rise to suspension of growth. Animals fed the supplemented protein were visibly smaller than the control animals fed the normal protein. At the end of a six-week period the experimental animals had gained an average of 20 grams in weight whereas the control animals had gained an average of 120 grams. When the experimental animals were returned to the normal protein diet, weight gains were resumed.



The animal on the left received a normal diet. The one on the right received additional amino acids which resulted in partial growth suspension.

Although both the experimental and control animals, apart from the size difference, appeared normal, exhaustive steps are required to trace and evaluate the metabolic differences. To accomplish this phase, the animals are sacrificed at the end of the six-week experimental feeding period. The liver is extracted, its enzyme system studied, and the changes in protein metabolism recorded. This entails isolating the enzyme systems from the liver and observing abnormal changes in oxygen uptake as measured by a Warburg respirometer. Studies are made of the cholesterol level in the blood system, and the fatty acid composition of the liver. The electrophoretic pattern is noted to evaluate changes in blood protein.

Results thus far suggest that further intensive work is required to understand clearly the various factors affecting growth suspension. The supplementation of proteins with crystalline amino acids appears to have an influence on the liver enzyme systems. The relative influence on the amino oxidase system and the deaminase system is to be investigated further.

This research is providing a better understanding of protein metabolism which could have important significance in human nutrition. Growth suspension has an apparent link with delay in aging. A well-known U. S. chemical company has used similar supplementation practices to maintain chickens at a relatively static physiological age for one year. In the future, life may well be prolonged and aging retarded through dietary influence on metabolic pathways.

Dairy Club News

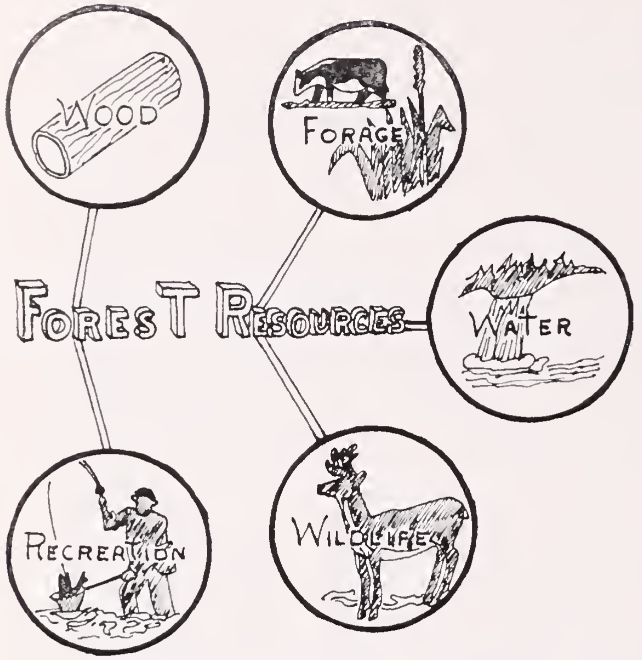
The Clemson Dairy Club started its year with a student-faculty picnic. About fifty students, faculty members and wives gathered at the YMCA cabin for a chicken barbecue. The chicken, prepared by our president and chief cook, Larry Gause, was very good. Naturally we had milk to drink and ice cream for dessert.

The Clemson Dairy Cattle Judging Team arrived in Clemson on October 10, after a two week long judging trip. The team judged at Memphis, Tennessee, and Waterloo, Iowa. The members of the team are Ronald Gaston, Jimmy Moeller, and John Skinner. The team is coached by Mr. C. C. Brannon.

Clemson's other Dairy Judging Team, the Dairy Products Judging Team, participated in contests at Norman, Oklahoma, and Dallas, Texas, during the first week in November. The team judged in both the southern and national contests and were away from Clemson eight days. The team is composed of Spann Brabham, Shuler Houck, Lloyd Kapp, and Jimmy Williams. The coach is Dr. J. J. Janzen.

The National Forests... Benefiting Every American

By Danny Lamb, For.



"Operation Multiple Use" is the key word in the Forest Service today. But what does it mean and how does it affect every American?

The policies of the National Forests were outlined in a letter written in 1905 by Secretary James Wilson to Gifford Pinchot, then chief of the Forest Service. In this letter, Mr. Wilson demanded that the National Forest land be devoted to the most productive use for the permanent good of the whole people; that the wood, water, and forage of the forests be conserved and wisely used and that the "greatest good for the greatest number in the long run" should always be foremost in the minds of the administration.

The Multiple Use program now applied to the National Forest is providing greater use, fuller enjoyment, more jobs and expanding wealth from our forested area. You as an American, are part owner of some 181 million acres of valuable forest land. This land is being properly managed to provide the greatest possible continuing use by the American people. "Operation Multiple Use" is indeed benefiting every American.

More and more people are using and depending on the National Forests each year. There is a growing need for greater supplies of clean, clear water, for more trees that will yield good wood, for more grass to feed livestock, and for more food and homes for wildlife. The growing interest in outdoor recreation in America is amazing.

Unlike many of our natural resources, the forests are renewable. Nevertheless, new forests are not "just over the hill" and the acres we now have must be literally stretched to produce the extra goods and services required of them. Multiple Use is the best form of forest land management yet devised in terms of producing the overall benefits demanded from the National Forests.

In brief, the story of "Operation Multiple Use" is to provide for this and future generations, more and better wood and wood products, a more abundant supply of water, adequate facilities for recreational use, a better grazing range, and improved hunting and fishing. In addition, Multiple Use helps to create better jobs and payrolls for a more stabilized economy.

Multiple Use is only one way in which the Forest Service is attempting to improve our forest land for the greatest service to the Nation.

The work of forest conservation has grown rapidly, extending its benefits in all directions. Not until 1902 was "forestry" listed as a subject in the Encyclopedia Britannica. Today it is a living movement toward more and better things from our forest. Let us keep it growing healthily.

Scene: Driveway beside suburban home.
Time: Just before Father arrives from work.
Action: Housewife placing child's bicycle in driveway where husband can't miss it.
Sound (From yard where child is playing): "Mother-r-r. I'd rather do it myself."

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PEAR PERSONALITIES

By Loren Brogden, Hort.

Dependence on one or a few agricultural commodities is not a sound economic practice; economists tell us that by broadening the scope of our production we gain stability in our economic system. The production of crops is a highly perfected science.

Geographic regions produce those products in which there is the greatest return; the adaptability and consequent yield potential of any one crop determines its incorporation in the economic program. Occasionally there is a crop whose potential is vast, but which has certain limiting factors which render it useless. Pears are one such crop in the southeastern United States. Horticulture research activities begin here where there is a potential gain for society.

The development of a variety of a crop for a particular region requires research. Research, whether it is limited to a definite problem or concerned with a general topic, calls for men of many skills. When the horticulturist begins his work he may find that he will need to be a geneticist, bacteriologist, physiologist and fertilizer specialist—the list is endless. A current project conducted by Clemson College in cooperation with a nationally known baby food company is an example of the challenging aspects of horticultural research.

The project under consideration concerns the production of desirable pears. This seems simple enough; there are certainly a number of acceptable pear varieties on the market. It should be simple to buy some trees and plant an orchard, but progress doesn't come that easily. Pears are easily infected with fire blight, caused by the bacterium **Erivinia amylovora**. Once the fruit is produced it may contain a large percentage of stone cells whose grittiness may render the fruit unmarketable.

The pear producing regions of the United States are the Pacific Coast States (California, Oregon and Washington and to a lesser extent the eastern states of New York and Michigan. Commercial production is limited to these locations because of numerous problems, fire blight a major one.

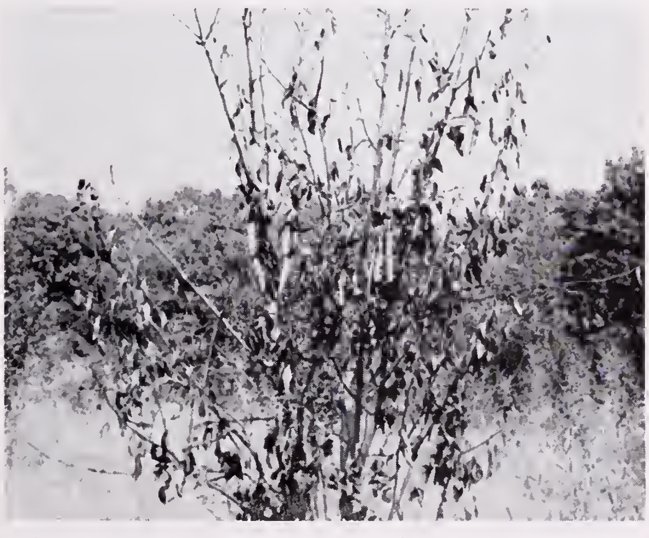

Figure 1: The effects of fire blight can be seen on this heavily diseased tree.

Fire blight causes great losses when it strikes commercial orchards. An outbreak is largely unpredictable; radical changes in temperature and moisture conditions encourage its growth. The southeastern United States' climatic conditions of high temperature, abundant rainfall, and high humidity are conducive to blight growth.

Fire blight attacks trees in one of three ways: 1) attack centered on blossoms, 2) attack mainly on new shoot growth, and 3) concentration on the main trunk. The severity of each form varies with the tree, and any combination may be seen on a particular tree. Previous study has shown that tree form, cultural practices, and the variety of the tree affect the severity of the blight. The Clemson project has been designed to afford the researchers as much freedom as possible in their investigation of these and other problems.

A principal concern is that of developing a desirable rootstock, one which will have good growth characteristics and be resistant to fire blight. At the present time Domestic French rootstocks are used in the major pear producing regions; however, these are susceptible to fire blight. Southern nurseries have had difficulty in budding this stock because leaf diseases cause premature defoliation and early hardening of the wood. Southern nurseries have been using **Pyrus calleryana** as rootstock. This stock is a vigorous grower, is resistant to fire blight, and is budded easily. Certain Oriental rootstocks have been found to be associated with pear decline and have recently been rejected by growers in major producing regions. However, it is felt that one of these two stocks will be the best for South Carolina. Blight resistant pear varieties have been selected for grafting on the rootstock; the selected varieties are Starking Delicious (Maxine), Magness, and Moonglow. Besides their relative freedom from fire blight, these varieties are fairly free from large stone cells, which makes their marketability much greater.

After establishing the particular type of tree to be used, the next concern will be cultural practices. Earlier research has suggested that the growth status of the trees, which is affected by pruning and fertilization and other cultural practices, is related to fire blight resistance of the tree. It is quite obvious that the more severe the fire blight the less producive the tree. These practices will be considered by the project also.

Pruning will consist of four types: 1) no pruning, 2) modified central leader, 3) modified central leader plus heading back and thinning out, 4) modified central leader plus thinning out.

The shape of the tree will be investigated by various shaping procedures using Starking Delicious trees. These procedures will include hanging weights on the limbs, wiring the tree, and the use of notched sticks to achieve a wide-angled

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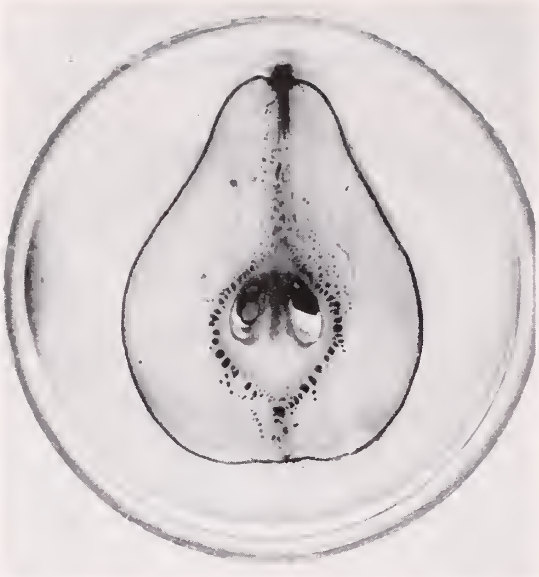

Figure 2: The stone cells under discussion are seen as black spots around the seed cavity of a freshly opened pear.

PEAR PERSONALITIES

(Continued From Page Fifteen)

pattern of branching.

The application of various levels of nutrients will also be included in the project. Results will be checked for: amount of fire blight under each treatment of fertilizer; tree growth (measured in trunk diameter and linear growth), and, eventually, fruit yield and quality.

Effective use of chemicals such as weak Bardeaux and antibiotic sprays applied during the period of blooming will be considered. Zinc chloride has also been used quite effectively. This area of study is open for thorough investigation and could possibly lead to important advances.

All of the activities of the project are directed toward fruit production, for this is the economic objective of growing pears. The production of fruit from the various test sections will be checked for optimal harvest time. Fruit will be examined for stone cell content. Determinations of soluble solids and acidity of fresh fruit and the color and flavor of the processed pears will also be made.

Fruit from the developed stock will be subjected to thorough tests and evaluation. The presence of stone cells makes an otherwise desirable fruit valueless.

The use of fruit for baby food necessitates reducing the whole pear to a puree (a paste-like suspension of the fruit). The presence of stone cells makes the puree gritty and is extremely objectional. Stone cells are sclerenchymatous cells which, because of their cellular structure, are extremely hard and in an aggregation result in the grittiness mentioned.

The determination of the size of the cells and their distribution is extremely difficult. Stone cells are held together by connective fibers which must be broken down before accurate measurements can be made. Work carried on under the direction of Mr. L. O. Van Blaricom of Clemson College resulted in a fourteen step procedure for the separation and weighing of the individual stone cells. Results from this work show that it is primarily the larger stone cell particles which affect the grittiness of the puree. These then are the ones which need to be eliminated from the pear through breeding or processing methods. Screening has been suggested as a possible method for eliminating the undesirable cells.

The Clemson pear project is an example of the work done by the horticulturist. The work varies from spreading fertilizer to taking readings under a microscope. The limitation of the work is the imagination of the scientifically trained mind.

HIGH SCHOOL SENIORS VISIT CLEMSON

By Kenneth K. McDaniel

On November 2, 1963, we of Clemson College and the School of Agriculture were host to a number of high school students and parents participating in Clemson College's annual high school visitation day. These visitors were met at 9:00 a.m. in the college auditorium by College President Robert C. Edwards and Dean of Student Affairs Walter T. Cox for a brief introduction and welcome to our campus. They were shown the film "This is Clemson," a pictorial presentation of the Clemson story narrated by Bob Cummings. A tour of the various schools was then conducted by the faculty of the host schools. The visitors were exposed to requirements for entrance, degrees and curricula offered and other information regarding college life and the choosing of a major field of study. At the conclusion of the tours the visitors were invited to have lunch with the students in the College Dining Hall and to attend the Clemson-Wake Forest football game as guests of the college.

Figure 1: A group of agriculturally minded high school students are shown approaching the Plant and Animal Science Building. Some of the picturesque Clemson campus is shown in the background.

High Value—Low Cost Broilers For The Consuming Public

By Billy L. Amick, Poultry Sci.

The increasing rate of consumption of poultry meat since 1940 has been phenomenal! The public consumed an average of only 2 pounds of broiler meat per person in 1940. Today, the average individual consumes over 25 pounds of broiler meat per year! Annually, almost 2 billion broilers are produced in the United States.

The gigantic increase in broiler production since 1940 has been due to a complex of factors that have affected both the supply and demand of this product. In recent years, despite declining prices, producers have been willing to offer increasing supplies of poultry because the cost of production and marketing of poultry has been greatly reduced. Reduction in cost of producing broilers has been largely due to sensational advances in nutrition, genetics, disease control, and management of broilers on the farm. Other factors have also been important, including the change in organization structure, financing of the broiler and retail food industries, and the downtrend in broiler prices. The reduction in cost of production has been passed on to the consumer, as evidenced by the low price of broilers in retail stores.

Fortunately, during this growth period the consumer has gone along with this increase in production and decrease in consumer price. He ate 1 two-pound broiler in 1940, and he ate the equivalent of 12 3/4 two-pound broilers in 1962. This demand for more poultry has been enhanced by its increased availability, convenience in packaging, and quality of the product. All of this was assisted by the facts of population increase and growth in per capita income.

The consumption of broiler meat has become a firmly entrenched habit in the American way of life. The product has adapted itself daily to the dinner table, to the picnic table, and to the back yard cookout craze. It can be reasonably purchased and prepared successfully by the new bride or the professional chef.

Broiler production has restored the economy to many marginal farm operations, allowing many to expand their holding and increase their buying power. Others benefiting from the poultry industry include equipment manufacturers, drug houses, the automotive industry, the shipping industry, and a number of other allied industries.

Undoubtedly more research work has been conducted on this broiler type chicken than on all other farm animals. For example, in 1948, 3.95 pounds of feed were required to produce 1 pound of broiler meat. In 1962, however, only 2.25 pounds of feed were required per pound of meat—exactly 1.7 pounds of feed less to do the same job. The broiler chicken lends itself to experimentation. Quick results because of short life cycle and the availability of large numbers of subjects are helpful to the researcher.

Contributing to the strong consumer demand for the ready-to-cook broiler, much to the chagrin of the industry, are the merchandising methods being used by some large chain stores. These chain stores feature the ready-to-cook broiler as so called "leaders." They under-price broilers to entice the consumer into their place of business. In spite of such practices as these,

(Continued On Page Nineteen)

Kappa Alpha Sigma

By Hugh Gray

The Kappa Alpha Sigma, Clemson Agronomy Club, started off this year with a cookout on September 23, for all members and freshmen majoring in Agronomy.

The Agronomy Club formed a soil judging team in early October under the direction of Dr. G. R. Craddock. This team, composed of Tom Boyce, Joe Weeks, Tommy Coward, Budgy Wilhelm and Jimmy Palmer, participated in the Regional Contest on November 8, 9 at the University of Georgia.

The club has obtained permission to install a candy machine in addition to the club's Pepsi machine on the second floor of the P & A building. These will be the two major fund raising projects.

Several distinguished speakers will be guests at the meetings this semester.

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WHOSE MIND TOMORROW?

Dr. W. H. Wiley, Dean of Agriculture

People in educational circles throughout the country are mulling over various thoughts in their minds about curriculum development, trying to look ahead at what our students will be needing 25 - 50 - 100 years from now; developments that must be started at this time in order to make some of those things possible in the future. Many of these thoughts and mental gymnastics are reported as facts in much of the literature one reads today. Unfortunately, a great deal of this is opinion and speculation. Unfortunately, that is oftentimes all that we can use in predicting future activities in the academic world. Much of this writing has caused some unrest among students.

Some students have found it impossible to settle down solidly and approach their program of study in a positive manner. All too often they have been made to feel inadequate, and have been led to believe that they fall short of the mark of an educated man when they have completed their undergraduate training. I am one of those peculiar people who do not feel that this is the case.

I feel that our students can stand up and do battle toe to toe with the classicist of the 19th century and earlier, but his approach to things may seem a little different to the person who has been in the educational field for a long time. The student today, it seems to me, has a quicker grasp of situations around him than the student who thumbed through his moldy book in the dimly lit and completely silent library hall, or who worked at his unruled tablet with his quill pen in hand and a flickering candle in front of him. On occasion I have felt, and I am sure others have, too, that if I were subjected to some of the psychometric testing that students must take who are preparing for college today, surely I would fail to make the grade. I am sure that many of today's young potential students have the same fear, and yet our total mind has been developing during all the span of time in which knowledge has been accumulating, without our really realizing what has been happening to us. I am sure that, if put to the test, we would be more capable of handling the materials than we think.

If a hundred years from now, we could look back on today, I am sure that we would see a tremendous change in the fund of knowledge to which a student is subjected. I am sure we would find that the student's preparation through the elementary school system, and through the secondary school system, was equally as different from today's preparation so that the student might be prepared to handle the more voluminous program and the more advanced program that will surely be demanded of him tomorrow. The one thing which we must keep in mind is that the mental capacity of the mass of students doesn't undergo an overnight evolution which puts them in a more highly graduated scale of mental capability.

I would say today's human being is, basically, much the same as the student of a hundred years ago; and this is true regardless of race, color or creed. The agility of the brain has undergone some changes through the adoption of new teaching methods and new living habits. I am sure that newer methods and different living habits will continue to change and shape the mind of the average and above-average student from now on. What I am trying to say is that you who are students in agriculture at Clemson today, will be fully as capable of meeting challenges which face you tomorow as were the students in agriculture 50 years ago, and as will be the students in agriculture at Clemson 100 years from now.

I wouldn't have you become complacent, for you still have a lot of work ahead of you, but I feel that the student who is passing his work adequately is trained today better than he thinks. I would use this opportunity to encourage you to stick to your guns and dig just as deeply as you can, for it will fall your lot, some years from now, to be the one responsible for what happens to the students who follow you. It must always be uppermost in our minds that if this country is to remain the leader in the agricultural sciences, we must maintain a strong mental inventory.

Uninformed people will continue to ask "Why study agriculture?" In fact, the question may be asked more often as time goes along; but unless we have people who are quite capable, and who are well trained, we will find that our agricultural proficiency will slip backward. The present trend in the educational world is in the direction of the liberal, general type of study, or into the astro-physical sciences. In other words, everybody wants to study how to get to the moon. My precaution to us is that we continue to study on how to have the food there for them when they get there.

GAMMA SIGMA DELTA

The Honor Society Of Agriculture

By T. L. Senn
President, Clemson College Chapter

Gamma Sigma Delta is a faculty controlled society that selects its members from graduating seniors, graduate students, faculty and alumni in agriculture. The Honor Society of Agriculture—bringing honor and agriculture together—gives a feeling of having done something great. That is exactly what Gamma Sigma Delta attempts to do for the individual member.

The initials of the name were selected in 1917 from the Greek words Gaea, Syndesmos and Demeter, whose meaning is: "The binding together of earth, the mother of all, and the practice of agriculture and the arts relating thereto for the welfare of mankind."

Chapters are now scattered halfway around the globe. The Clemson Agricultural College Chapter was established in 1957. The Clemson chapter has 90 active members and 17 alumni members.

The basic objective of Gamma Sigma Delta is to recognize and stimulate excellence in agriculture. No other general professional area has exceeded the excellence exhibited by agriculture over the past several generations. This excellence has been dependent upon outstanding leadership as well as upon high quality students and scientists solving many problems that have been confronted.

The chapter each year presents a certificate of recognition to an outstanding sophomore and to a senior student in recognition of scholastic achievement, and as a stimulus to achieve higher levels of attainment.

Membership is conferred as an honor on those students in agriculture who have shown exceptional ability. These awards are made at an annual banquet.

Senior agricultural students, not to exceed 15 per cent of their number in agriculture, may be elected to membership. These students must rank scholastically in the upper 25 per cent of the class, and they must show promise of future leadership in some phase of agriculture in its broadest meaning.

Graduate students of outstanding ability in the various fields of agriculture or closely related sciences, and alumni and faculty who have, by virtue of outstanding achievement in agricultural pursuits, demonstrated their worthiness of the honor, are also eligible for election. The eligibility requirement for faculty members is at least three years experience in agriculture or science related to agriculture with demonstrated exceptional teaching or investigational ability. Alumni are eligible for election not sooner than five years after graduation by virtue of signal service to agriculture.

Luncheons are held each semester along with various types of informative programs of interest to students and faculty.

Agriculture must keep pace with industry in the United States in all respects to provide for the nation's welfare and to meet the increasing food and textile requirements of an expanding population. No group of scientists, students or technicians has a more important task than those in agriculture. Gamma Sigma Delta has a place in keeping the nation conscious of the importance of agriculture. As this group grows in strength its beneficial influence increases accordingly. Those honored by Gamma Sigma Delta by election to membership are destined to lead in this advance on some front. Their election is more than an honor: it is a challenge that they do so.

High Value—Low Cost Broilers

(Continued From Page Seventeen)

and many other problems facing the industry, we have a big winner nutritionally over the chief competition from beef and pork. Both competitive products contain over three times the number of calories in equal portions of meat. Chicken, pork and beef contain about the same percentage of protein; however, similar portions of beef and pork contain up to ten times the amount of fat found in poultry meat. These nutritional facts further indicate the high value of the reasonably priced ready-to-cook broiler for the consuming public.

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WHERE WILL YOU GO FROM HERE?

By Basil Acock

What made you decide to study agriculture? Was it because you like the open air and the smell of the soil; or was it because you thought that agriculture courses would be the easiest for you? Did you think first about the financial reward attendant upon your graduation; or did you just want to learn more about living things? If your interest was in the plants and animals themselves, maybe this article is for you.

When I started my studies in agriculture, I had visions of turning my knowledge into profit by having my own farm. Then the research bug hit me; and my ideal changed to one of finding out new facts about agriculture for the betterment of mankind in general. Now, I suppose a man can reach this sort of decision by reason of his religious convictions, his patriotism, or plain old scientific curiosity; but it has been my experience that a good many students of agriculture, like myself, have a genuine humanitarian desire to make two blades of grass grow where only one grew before. This is not an ignoble desire even in this land of surplus, because, with the present population explosion, it will not be so very long before we will need to bring the margin lands back into production. Also, the way in which we have been able to help famine-stricken nations, and more recently the countries of the Soviet Union, is probably one of our better pieces of propaganda against the spread of Communism.

Very soon, however, I began to wonder whether I would be realizing my full potential if I stayed "at home" in the civilized world. There are distinct arguments for and against working at home as opposed to working in underdeveloped countries. On the one hand, here in the civilized world I could work in a good academic environment with the latest instruments and the best scientific literature. Perhaps I could make some major break-through during my life; but then again, perhaps I would just become another in the growing ranks of the mediocre fact-finders. On the other hand, I read that 60% of the world's population is undernourished and that, to give but one example, the introduction of the hand hoe to Afghanistan boosted production by some 30%. This makes me wonder whether the little knowledge that I possess might not be better used in these underdeveloped countries.

Naturally, the picture is not quite as simple as I have painted it. The first requirement for working with the people of backward nations is that you be acceptable to them as a man. One definite prerequisite, then, is adaptability, including a willingness to learn from these people before rushing in to change their way of life. It is also necessary to accept the fact that only the most basic concepts of agriculture will apply in these tropical environments; and these must be introduced to the people little by little. Many a scheme for developing tropical areas has failed because it attempted to transpose temperate region farming practices into a completely different environment.

Despite these difficulties, it seems worth the extra effort to teach primitive farming communities how to increase their food production, because this is the only permanent solution to the world food shortage. Increased production leads to a higher standard of living and this, in turn, is usually accompanied by a decrease in the birth rate. It's a rather long-term project; but if you want a world for your children and grandchildren to live in, then you had better start doing something about it now.

Of course, it has not been my purpose just to tell you about my own thoughts and decisions on this subject. Rather, I want you to awaken to the problems and possibilities of service abroad. If you are interested and would like to read further on the subject, try to get hold of "Food for Peace," the American Society of Agronomy Special Publication No. 1, April 1963. It is an up-to-the-minute account of what is being done and what still needs to be done. If you are moved to serve abroad, you will find that it is almost impossible to get permanent employment in an underdeveloped country unless you are prepared to free lance. However, the Peace Corps provides opportunities for short tours of duty and this is one way in which you can play your part without becoming too deeply or permanently involved. We have knowledge that can help the poorer nations. It is an honorable occupation to stay at home and add to that reservoir of knowledge, but it is also an honorable occupation to disseminate that knowledge. It is the age old question: "Who will go?" being asked over again; and its more personal equivalent is, "Where will you go from here?"

Poultry Science Club News

By Billy Amick

The Poultry Science Club held its first regular meeting on September 24. At this meeting, Club President Dean Pruitt introduced the following new officers: Vice-President, Johnny Dehart; Sec.-Treasurer, Wayne Long; and advisor, J. F. Stephens. Several speakers were suggested for future meetings.

On October 8, the members voted to process and sell turkeys as a fund-raising project. The turkeys will be sold through the Agricultural Products Sales Room in the Food Industries Building. Dr. Douglas Hamm, Poultry Extension leader, was the guest speaker at this meeting. His topic was "The Future of South Carolina Eggs."

Mr. Furber Whitmire, a representative of the Quaker Oats Company, is scheduled as guest speaker for our next meeting. All interested individuals are invited to attend these meetings held in room A-104, P & A.S. Building.

"Did you know that Bill doesn't have a last name?" "Bill Who?"

HORT CLUB NEWS

By John D. Ridley

This year, without an exception, the horticulture club's activities seem greater than ever. We have made two types of jelly this season, grape and peach. The club is also in the process of propagating plants for sale to make money to aid the students in attending the Regional and National meetings of the American Society for Horticultural Science. There will also be a project in growing container stock for sale by the club.

Last February we had a large number of representatives to attend the Memphis, Tennessee, meeting of the Southern Region ASHS. At present, the Hort Club is looking forward to the February meeting in Atlanta, Georgia of the Southern Region ASHS. At the National ASHS meeting at Amherst, Massachusetts, Gordon Halfacre, Butch Ferree, and Ronnie Robbins represented the Clemson club. We are also planning a field trip to Charlotte, North Carolina for the annual Southeastern Flower and Garden Show in March.

Bruce Tyson is planning to present a paper in Atlanta, Georgia in competition for the Joseph B. Edmond Award, which was won last year by Clemson Hort. student Ronnie Robbins. We are happy to know that Ronnie, in giving his fine paper at the national meeting in Amherst, Massachusetts in August, won the first place L. M. Ware Award along with his election to the National presidency.

John D. Ridley received a part time scholarship from the Garden Club of South Carolina. This illustrates the fact that the Garden Club of South Carolina is backing the Department of Horticulture at Clemson.

Pre-Veterinary Club

The Pre-Veterinary Club at Clemson held its first meeting September 25, 1962. It began, at this time, with a charter membership of thirty, consisting almost entirely of students in the Pre-Veterinary curriculum.

The club is primarily for Pre-Veterinary students, but the club welcomes any student interested in Veterinary Medicine.

The meetings are held on the first Tuesday of each month in Room 123, Long Hall. The club plans to make trips to the University of Georgia's School of Veterinary Medicine Open House and also to visit the Livestock-Poultry Health Laboratory near Columbia. The highlight of the year is the annual dinner meeting in the spring of the year to which an outstanding speaker is invited.

Each year the Pre-Vet Club, as it is known by the members, is striving to do bigger and better things. This year the membership has almost doubled, and many new and interested programs are planned.

Hotel Page: "Telegram for Mr. Neidspindiavanci, Mr. Neidspindiavanci.

Mr. Neidspindiavanci: "What initials, please?"

Alpha Zeta News

By Joe Barnette

Alpha Zeta held its first meeting of the year on October 14th in the P & A auditorium. The meeting was an informal smoker with the "Profs" from the Ag School, who were former AZ members in the college days, invited. Plans for the new year were presented by the chancellor and AZ's advisor, Dr. Shain. Committee assignments were issued and each point discussed. The following are projects which Alpha Zeta at Clemson hopes to accomplish during '63-'64: a) Operation contact—Jake Joye, Larry Stroman b) P & A study rooms open at night for study—Tom Garrett, Joe Shealy c) AZ paper weights—Jim Potts d) Teacher evaluation—Jimmy Howard, Richard Cooper e) AZ banquet and programs—Butch Ferree, Lloyd Kapp f) Student initiation — Loren Brogdon, Doug Heath g) Book sale—Joel Hanks, Shuler Houck h) Outstanding teachers—Ernest Sheeley, Jim Troutner i) Projection—Jimmy Williams

"Waiter," said the diner, who had just sampled his dinner, "these veal chops don't seem very tender to me."

"Sir," said the waiter, "I used to be a butcher and I can tell you that less than a month ago those chops were chasing after a cow."

"That may be," replied the man, "but not for milk."

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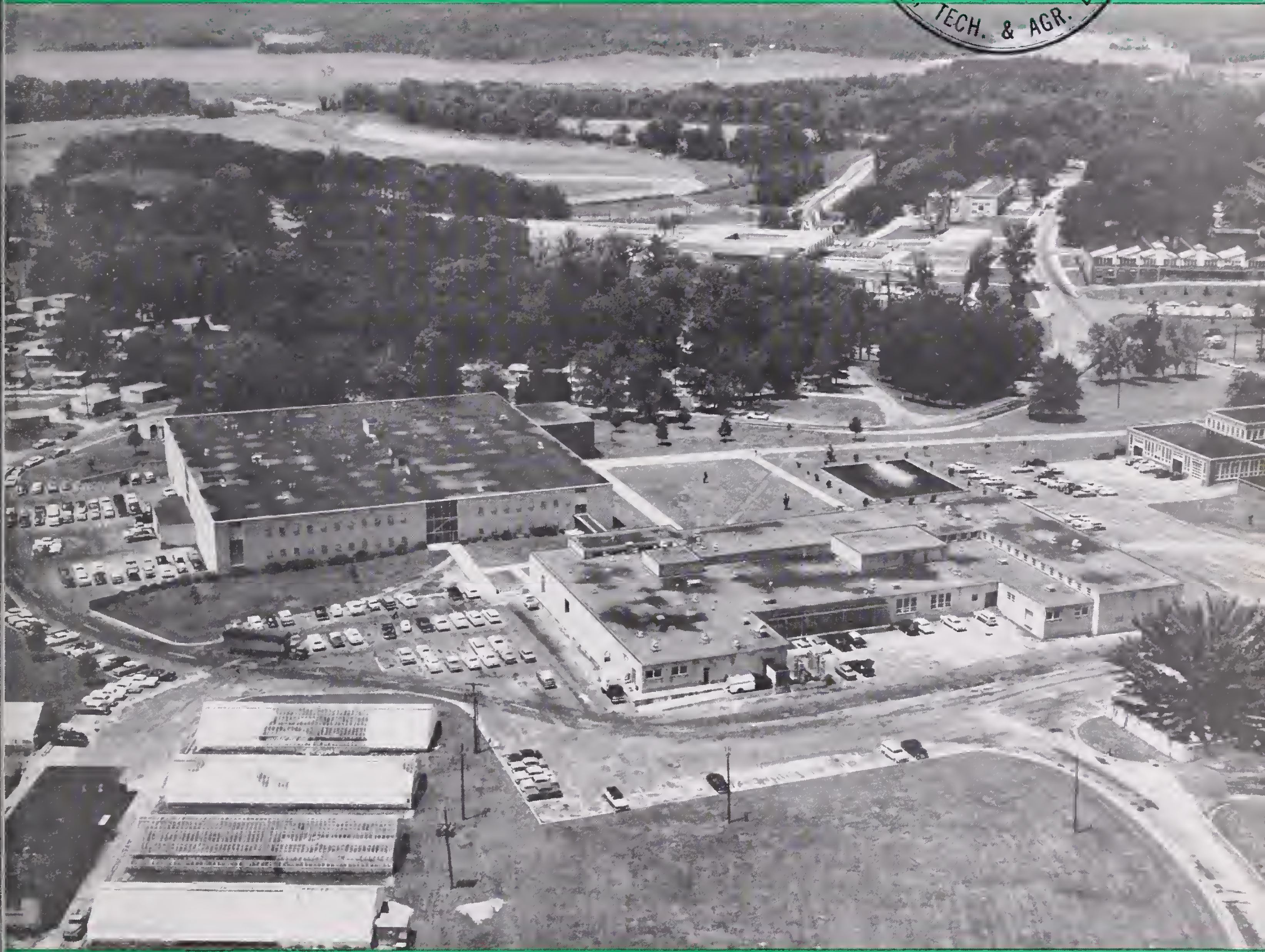

CLEMSON UNIVERSITY
CLEMSON, SOUTH CAROLINA

SPRING AND SUMMER
1964

MEMORANDUM

SUBJECT: Use of potassium nitrate in tobacco fertilizer.

OBSERVATION: It appears that the use of potassium nitrate increases the potassium content of the tobacco leaf, increases yield, and improves the smoking quality of the tobacco.

COMMENTS: Potassium nitrate is highly soluble and readily absorbed by the plant. The nitrate ion is readily assimilated and the potassium ion would probably combine with an organic anion. The potassium organic compound would be less soluble in the plant sap than the potassium nitrate. The lower solubility and the lowered potassium ion concentration in the plant would result in the absorption of a relatively large quantity of potassium.

Where relatively large quantities of chlorine are present in the plant, the potassium chloride would tend to maintain a relatively high potassium ion concentration in the plant sap. The high potassium ion concentration in the plant would tend to lower the intensity of absorption of additional potassium. Increasing the potassium content of the plant without increasing the chlorine should significantly increase the intensity of the absorption of carbon dioxide by the plant.

The increase in the availability of carbon dioxide for photosynthesis could result in higher yields and higher content of sugars and other carbohydrates, which improve the smoking quality of the tobacco leaf.

In wet seasons, and in some poorly drained soils, excess water may exclude soil air, which will result in inadequate soil aeration and a deficiency of available oxygen in the root system of plants. The oxygen in nitrate ions, liberated by reduction reactions within plants, may significantly increase the supply of available atomic oxygen for crop plants, particularly in the root system. A deficiency of oxygen in the root system is often a critical factor in crop production. However, this problem may be corrected by the application of adequate quantities of nitrate nitrogen.

H. P. Cooper

(Dr. H. P. Cooper is retired and was formerly Director of The Clemson (S. C.) Agricultural Experiment Station).

This memorandum is reproduced through the courtesy of Southwest Potash Corporation.

The Agrarian

CLEMSON, SOUTH CAROLINA
SPRING-SUMMER — 1964

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COLLEGE OF AGRICULTURE AND
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THE COVER

The cover design by Bob Upson shows the recently completed Clemson Agricultural Center, along with a drawing of the State of South Carolina showing the location of the Agricultural Experiment Stations.

Two buildings, along with ten greenhouses, make up the Agricultural Center located on the beautiful Clemson campus. These buildings are known as the Plant and Animal Science Building and the Food Industries Building, and together they help Clemson give to its students and the people of South Carolina a very modern program for agricultural teaching and information.

The Plant and Animal Science Building is a two-story brick structure containing over 175,000 square feet of floor space, and its rooms furnish classrooms, laboratory facilities, and office space for extension, research, and teaching personnel. The auditorium located at the front of this building seats over 300 people and is often used for lectures, conferences and other gatherings.

The Food Industries Building contains over 75,000 square feet of floor space and is a one-story structure. This building houses many processing laboratories that are used for both research and teaching. The dairy section features a milk bar where Clemson products are made available to students and the public.

The ten modern well-equipped greenhouses are used mainly by the departments of horticulture, agronomy and botany, and they furnish excellent facilities for student use.

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A Date With The Dean

By Dr. W. H. Wiley, Dean of Agriculture

I know some fellows in the School of Agriculture who are looking forward to June graduation with mixed emotions. The seniors are feeling that it has been a long uphill climb for at least four years, and in one sense they will be glad when graduation is over. In another sense, now that they approach the end of that period of hard work, they look back on four of the shortest years of their lifetime, and rather hate to see it come to an end. In either case, congratulations to the seniors are in order, and mine are most hearty.

The juniors have the feeling that come graduation, they will have to assume the responsible role of next year's seniors and take their official places in various student organizations, and fill some vacated shoes. I would encourage the members of the junior class to approach these positions with a desire for the honor that goes with an office, and also with a view to making a real contribution to the organization, and through that organization, to Clemson College.

This brings me to my second thought. On July 1 when Clemson becomes Clemson University, the School of Agriculture will become the College of Agriculture and Biological Sciences. I have been asked from several circles what this will mean to students, alumni, to the people with whom we work in other Colleges on the campus, and to people whom we serve out in the State. On a factual basis, the new name will only properly describe the total function that presently exists in the School of Agriculture. It will indicate that proportion of the total university which agriculture constitutes under the new terminology. But deeper than that, there is an image which will be involved. This image will be whatever the student body and the alumni make it. The term may seem trite—it's used these days rather glibly—but nothing comes back from a mirror except an image. We can create a beautiful image through scholarly attainment, through high caliber thinking, through long range planning, through loyal and enthusiastic support, and through a continuing interest in Clemson's agricultural program. But we can distort this image through a failure to accomplish any of the above actions.

As a third thought, I would like to take this opportunity to congratulate the staff of **The Agrarian** for a job well done, and I should like to encourage next year's editorial staff to keep up the fine work.

Agrarian Philosophy

By The Editor

THE AGRARIAN wishes to recognize an organization on campus which is striving to be of benefit to the students in agriculture. That organization is Alpha Zeta, the honorary and service agricultural fraternity.

To promote better student-professor relationships, Alpha Zeta initiated a program of teacher evaluation during the first semester of 1963-1964. Five students were selected at random from each class taught in the School of Agriculture. These students were each requested to fill out a questionnaire consisting of twenty objective type questions, seal the questionnaire in a furnished envelope, and return it unsigned to Alpha Zeta. Alpha Zeta in turn distributed the completed forms to the respective professors. Each questionnaire was seen only by the student who filled it out and the professor concerned.

It is too early to determine the value of the teacher evaluation, but some professors have commented that they have acquired valuable points from the program; a very few, however, have expressed disapproval.

Organizations which attempt to be of service are to be commended, and THE AGRARIAN feels that Alpha Zeta, through teacher evaluation and other projects, is certainly being of service to Clemson, its students, and to agriculture.

Ag. Econ. Club News

By William G. Dukes

The Agricultural Economics Club at the beginning of second semester held a meeting to decide whether to continue their Campus Pac Campaign from the previous semester. The club decided to continue the campaign until April 1, 1964. Upon the completion of this campaign, the Agricultural Economics Club had raised approximately $125.

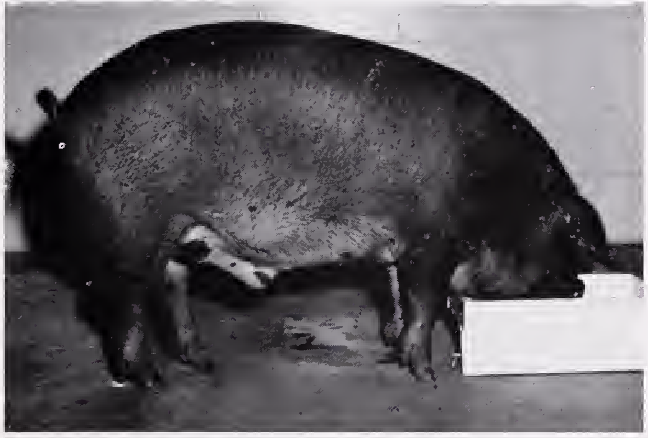
At our regular meeting on the 25th of February, a special program was planned. Dr. W. J. Lanham, head of Agricultural Economics and Rural Sociology Department, spoke on job opportunities in "agri-business." On the completion of Dr. Lanham's speech, a movie entitled "Oceans Away" was shown. This movie was concerned with agricultural opportunities abroad. At the completion of the movie, refreshments, furnished by the wives of our faculty advisors, Dr. Spurlock and Dr. Steele, were served.

The activities of the Club for the remainder of the semester will be directed towards the pubication of its annual brochure recognizing its seniors and graduate students, and its Annual Student - Faculty Banquet held on the Friday night of Junior-Senior dance weekend. The purpose of this banquet is to promote good relations between the students and the faculty. The members of the club and their dates are looking forward to an enjoyable evening with the faculty and their wives.

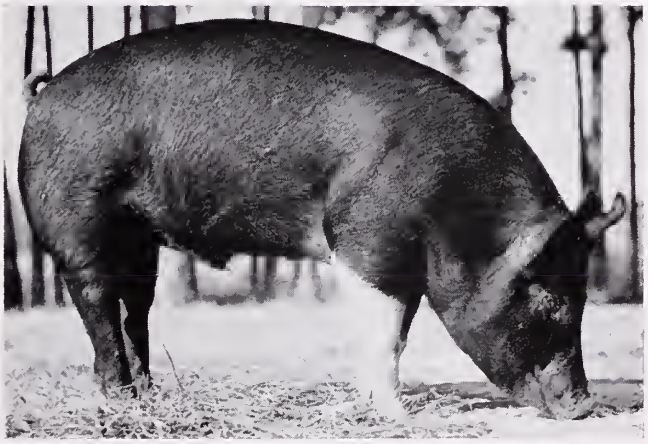
IDEAL MEAT-TYPE SWINE IS THE GOAL

By Dan D. Bozard, Animal Science, '65

Meat-type or "fancy" pork that will please the consumer and will be efficient to produce is the goal of today's modern swine producers. Modern swine technology leads the way in the production of this new model of meat-type hog. In the last ten years the emphasis has been on the production of a pork product to suit the consumer and increase the prestige of pork. Some consumers have been lost because of the poor quality of pork which was produced only a few years ago.



"Fat" pig of yesterday



Meat-type pig of today and tomorrow

The lean, meaty pork produced in the future will be one of the main factors which will contribute to the profit for the producers. A uniform meaty product will be easy to merchandise and should be more readily chosen by the selective consumer. This new product has a high nutritive value at a reasonable price.

What has recent research on the meat-type hog shown and how fast will the complete change take place? All indications are that it is possible to make rather rapid progress toward producing meat-type swine. For example, at the University of Tennessee Experiment Station, through various systems of breeding and selection of breeding animals for litter size, viability, growth rate, efficiency of gain, and carcass desirability, encouraging results have been obtained. Through research, Tennessee animal scientists have been able to reduce average backfat thickness by some 20 to 26% over a five year period. Along with this reduction in backfat thickness, the number of U. S. Number 1 swine was increased over 50%. The results of this work have confirmed the research of others, which indicates that backfat thickness has a relatively high heritability.

At Iowa State, one of America's oldest swine evaluation stations, hogs have been fed on a standard ration for six years. Meat yield records show the average carcass today is yielding 15.5% more trimmed, lean wholesale cuts than six years ago. What does this almost incredible figure mean? It means that if you were a pork processor buying the best hogs available, that in 1962 you would have gotten 5½ tons more trimmed lean wholesale meat from each 1000 head of hogs than you got in 1956.

The experimental data obtained at Iowa State reveal the purebred animals on the test were yielding 26.7% more lean meat in their loin eye (pork chop) than six years ago. There was also a 13.4% decrease of backfat and a 12 pound reduction of feed required to make 100 pounds of gain.

The Western Illinois Test Station found a 12.6% increase in lean wholesale cuts and a corresponding 20% decrease in backfat thickness over a four year period.

At the Ohio Swine Evaluation Station, backfat has been reduced 14.6% since 1954. Loin eye size has increased 6.6% and lean cut yield by 6%.

Data from certification tests on swine secured from purebred swine breeders in South Carolina and fed under uniform conditions at the Clemson College Experiment Station indicated that the animals meeting the certification standards gain significantly faster, on slightly less feed per pound of gain, and produce a leaner carcass. The animals in this test meeting the certification standards possessed significantly less backfat, more loin eye, and yielded a higher percent of the four lean cuts.

This progress on producing a meatier animal for the consumer has been stimulated and made possible through the swine industry's meat type certification programs, on the farm testing, and modernization of market swine shows.

The swine experiment stations have played a major role in the improvement of today's meat-type hog due to the fact that it is the stations' recording and interpreting of research that the producers have used to improve their herds.

Through continuing research and evaluation by animal scientists, the swine producer will be more able to meet today's consumer's demand for lean, high quality pork and thereby obtain a greater return for his effort to improve his swine enterprise.

The Tool Shed

By Jere Brittain

Editor's Note: Jere, a 1961 graduate in Horticulture, served as editor of THE AGRARIAN in 1960-61. The reactivation of the magazine during '60-'61 after two years of non-publication was due largely to Jere's efforts.

What's this thing, Dad?

It's called a grab-skip, Son.

Hey! It has an awfully short handle to be so heavy. Do you know what it's for?

Why, yes. It's for drivin' a grab or knocking it out.

A grab??

Right. There's a set hangin' on that peg. They're for pullin' logs.

Is this funny U shaped thing part of the grabs, Dad?

No, that's a clevis.

Celvis!!

Oh, the clevis connects the grabs to the singletree.

Dad, are you making these names up?

Nope . . . the singletree hooks the horse to the load, you see.

O. K. So how do you hook that sin . . gle . . tree to the horse?

With these. They're trace chains.

You tie the trace chains to the horse?

No. The trace chains are tied to the hames. They fit against the horse's shoulders. You'd carry the grab-skip in this ring here too.

Hames are mighty hard. Don't they hurt?

Not much. This collar and pad go under the hames.

Oh.

. . . . . .

Dad.

Hmm?

You must be kinda old.

Forestry Club News

By Danny Lamb

The Forestry Club is presently preparing for the local conclave held each year prior to the regional conclave. The local conclave features open competition among all forestry club members in a variety of technical and physical events. The winners of these contests will represent our club at Oklahoma State University in May. The regional conclave has a gathering of the top forestry schools in the South, and the competition is keen and fast. Many of our students have already begun practice in hopes of bringing victory to the Clemson Forestry School.

In order to raise money for this trip the club has been busily engaged in a variety of activities this year. On weekends members of the club cut and sold firewood to various people in town. During Christmas we also sold Christmas trees and holly as a further means of increasing our budget.

During homecoming weekend this year the club won first place with its "firetower" display. This was the third first place the club has won in as many years. On dance weekends the club also has "drop-in parties" for all members and their dates.

Each semester the club has a cookout at Lake Issaqueena and new members are initiated into the club. This semester the initiation and conclave were held at the old bath area on the lake.

The club meets every second and fourth Tuesday night in the clubroom beside Riggs Hall. We usually have a speaker or show films dealing with some phase of the forestry profession. Refreshments are served after each meeting and members usually linger around the clubroom and join in bull sessions about professors, tests, or sometimes, even forestry.

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DUKE POWER

Bob & Dona, Clemson University Ag Students

By Dixie Marion, Feature Staff

Photos by Bobby Lanford

Student life at Clemson consists of more than attending classes and studying. Here, Dona Hallum, Liberty, South Carolina, a sophomore majoring in Food Technology, and Bob Upson, Savannah, Georgia, a junior in Ornamental Horticulture, are shown enjoying the facilities of Hartwell Lake.

Dona serves as Second Lieutenant in the Angel Flight. Besides having their own drill team, members serve as hostesses for Air Force affairs.

The Swimming Team is only one of the collegiate and intramural sports at Clemson. Bob has lettered in swimming and is a member of the Block C Club.

Dona has found that living in the new girls' dorm is more convenient than commuting from home. It also enables her to spend more time fulfilling her duties as President of Omicron Sorority.

In his new position as promotion chairman of the Baptist Student Union, Bob is responsible for seeing that all students are well-informed on B.S.U. activities.

Dona and Bob pause during a study period in the library to discuss the life they share as Clemson students.

Have You Considered A Career With The Clemson College Extension Service?

By George B. Nutt, Director
The Clemson College Extension Service

A career in The Clemson College Extension Service is a possibility for majors in the various agricultural disciplines of Clemson College. Most of the male employees of the Service, a division of the School of Agriculture, are graduates of Clemson. Other state Extension Services, particularly our neighbors North Carolina and Georgia, have many Clemson graduates on their staffs.

Before we get into some of the details of the work, a brief explanation about the Service, including its origin, history and purpose, is in order.

Extension education was born of necessity due to the ravaging effects of the boll weevil which migrated out of Mexico into Texas during the early days of this century. Dr. Seaman A. Knapp, a native of New York, a graduate of Cornell and a pioneer educator, was called upon by the Federal Government to assist the people in the boll weevil infested areas. Demonstrators were employed to work with farmers in developing substitutes for their money crop—cotton. The system worked with various degrees of success and spread to other states suffering from economic agricultural problems.

A few demonstrators, or county agents as they were later designated, served this state as early as 1907. They were for the most part federal employees or employees paid from foundations.

A farsighted South Carolinian, Congressman Asbury Francis Lever from Lexington, became sold on Extension education and coauthored legislation creating The Cooperative Extension Service which was signed into law in 1914. This is known as the Smith-Lever Law. Thus we are celebrating this year the Golden Anniversary of The Cooperative Extension Service.

It is called "Cooperative" because it is financed from Federal, State and County funds and because local people have a strong voice in the program. In all the states the program is administered by a designated Land-Grant institution which has the privilege of determining the official name. Clemson's Board of Trustees gave the name "The Clemson College Extension Service" to our program and made it an official division of the school of agriculture.

Most of the finances for this state are derived from funds appropriated by Congress and the state legislature. Counties contribute a significant share and also provide offices for all of the county personnel.

The Cooperative Extension Service is known as the educational arm of the Land-Grant institutions and the U. S. Department of Agriculture. As such, its role is to inform people on the latest findings from the agricultural experiment stations, industry and other sources which will assist them in the solution of their agricultural and home problems.

Congressman Lever stated in support of the Smith-Lever Act, "The agent will become the instrumentality through which the colleges, states, and the Department of Agriculture will speak to all those for whom they were organized to serve with respect to lines of work engaged in by them." He added that "We have accumulated in the agricultural colleges and the Department of Agriculture sufficient agricultural information which, if made available to the farmers of this country and used by them, would make a complete revolution in the social, economic, and financial condition of our rural population."

The Congressman was a prophet. There was a revolution, and Extension played a significant role in it. The revolution continues as it must to keep abreast of the times.

A brief reference was made to the home demonstration or home economics phase of our program. Clemson students of agriculture may not have a lot of interest in this phase of our work because there is no undergraduate degree curriculum in this field. Home economics is of tremendous importance to Extension's overall program and much of our work involves the team

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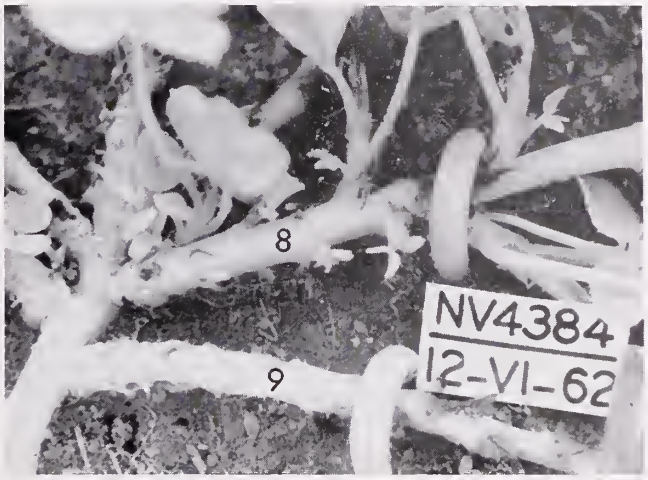
Chemistry In Fields Of Clover

By Fred B. Bracket, '65, and William E. Batson, Jr., '64
Biological Sciences

Chemistry and botany were once viewed as separate and distinct sciences, unrelated in their principles and applications. However, it is rapidly becoming evident that these two sciences have a direct interrelationship, especially in the areas of experimentation into the minute physiological processes occurring in all plants. By combining the sciences of chemistry and botany into an applied program of scientific research, many of the phenomena occurring in plants can be explained. The results of this experimentation can often be applied practically, the result being improved production practices or varieties of crops for modern agriculture.

A good exampe of this type of operation is a study into the physiological processes of white clover **(Trifolium repens** L.) being conducted by Dr. Ernest G. Beinhart, Jr., USDA research plant physiologist, working with Dr. James E. Halpin, plant pathologist, of the Botany Department, and Dr. Pryce B. Gibson, USDA geneticist. The project is directed toward the production of a more persistent variety of white clover adapted for forage use in the southeastern United States.



At present white clover is a good forage crop, but its lack of persistence makes necessary replanting, usually about every two years. It has been determined that the lack of persistence is correlated with a decrease in over-all rate of branching. Observance of Figure One will show that stolon eight has produced numerous branches, while stolon nine has produced a negligible number of branches. The answer to the question of persistence in white clover seems to lie in the causes of its branching.

Through careful field and laboratory experimentation and observation, it has been concluded that branching of white clover is definitely correlated with light intensity and temperature, decreased branching occurring under the influence of high temperature and low light intensity. It is believed that temperature and light affect a growth regulator system present in the plant. This system may consist of a stimulator, an inhibitor, or a combination of the two. The temperature and light may operate in such a way as to affect the synthesis of the components of this regulatory system or their utilization in the meristems of white clover.

Several methods of experimentation and analysis have been employed in the study of branching in white clover. First was the observation of gross plant responses, in which the absence of budding was first correlated with persistence. Later, techniques of histology were employed to prove that the problem was not one of insufficient energy (sugar) availability. Now, the chemical basis for the gross plant responses must be determined. As stated before, the presence of a growth regulator system or trigger mechanism affecting branching seems highly probable, but the exact nature of this system and the precise means by which it is affected by light and temperature have not been determined. Once the answers to these questions have been obtained, they can be applied to produce more persistent varieties of white clover.

Thus basic chemical research should lead to a logical answer to an applied botanical problem.

Have You

(Continued from page 6)

approach to farm problems with men and women working together.

The well-known youth program, 4-H, is a most improtant phase of Extension work. A high perecntage of agricultural students have been members of this youth activity which provides valuable training in agriculture, home economics and related subjects.

What Is Required To be an Employee of The Clemson College Extension Service

Since this is being written for **The Agrarian,** positions within the Service for men will be discussed as follows:

1. Employees must be graduates of Land-Grant colleges or universities, preferably with farm backgrounds.
2. They must qualify for admission to the graduate school. This is a requirement imposed in recent year because of the importance of graduate training to the program.
3. They should be genuinely interested in people and be willing to work long hours as demanded of farmers, homemakers and 4-H members.
4. Employees must be willing to travel. County workers remain in the confines of their respective counties except for authorized district and state meetings.

Experience has indicated that graduates from any of the agricultural disciplines can be expected to develop into good agents. This includes forestry, agricultural engineering, dairy science, animal science, poultry science, horticulture, agronomy, agricultural economics, vocational agriculture, entomology and botany. Reference here is to the county worker who joins the Service as

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Chemical Energy Weed Control

By William P. Brown, Agronomy, '64

Weed control is one of the oldest agricultural practices known to man. At the same time it is one of the newest fields to receive detailed, scientific attention.

The practice of weed control is essential for the production of all crops. Weeds compete with crops for water, light, mineral nutrients, and space. Weeds increase the cost of labor and equipment, reduce the quantity and quality of crops, and harbor insects and diseases.

Man has accepted the weed challenge and waged war with its forces by many means including his own tedious labor. Man first started out with the hoe, then shifted the burden to livestock. After many technological advances, mechanical devices ranging from the sickle to the diesel tractor, complete with tillage implements of all kinds, were used; but the hoe was always present.

According to U.S.D.A. publications, much of the energy and horsepower used on farms is for the purpose of moving more than an estimated 250 billion tons of soil each year. This represents the world's largest materials-handling operation, and the energy required to perform this work is enormous. At least one-half of this vast tillage and cultivation operation is practiced solely for the control of weeds. Energy is defined as the capacity to perform work. In this context, herbicides are real work horses. In effect, herbicides represent additional production tools or sources of energy for increasing farming efficiency by reducing horsepower and energy requirements.

The cotton crop has traditionally been one requiring a tremendous amount of hand labor. Hand labor was required to control weeds in the row during the growing season, and at maturity additional labor was required to harvest the crop. The use of mechanical cotton pickers was not fully practical as long as the hand pickers replaced were also the labor force necessary for the hoe work. It was not feasible to employ labor for this small portion of the season. The advent of improved methods of weed control by chemicals virtually eliminated the need for hoe-hands. This allowed mechanization of cotton production to proceed. In a recent publication by U.S.D.A., cost studies in cotton show that to control weeds in this crop by hoeing and cultivation requires 25 to 30 man-hours per acre per year at an annual cost of $15 to $20. The use of herbicides for weed control in cotton reduces the man-hours per acre from 8 to 12 and lowers the cost of weed control from $8 to $12 per acre. If we apply these per acre savings to the entire cotton crop, farmers will save more than $75 million each year. This is only one example of the work-performing capacity of herbicides and points to the vast potential value of chemicals in improving farming efficiency.

Weeds are also a problem in other than agricultural situations, and their control is of concern to virtually everyone no matter what his occupation. Control of undesirable vegetation is of major importance in the maintenance of highways, railroads, industrial plant grounds, commercial waterways, lakes, irrigation systems, golf courses, lawns, and many other situations touching nearly every aspect of man's activity. Weeds such as poison ivy and ragweed, which cause hayfever and other allergies, contribute markedly to human misery, and their control is of great concern to many people.

Progress in chemical weed control during the past 10 years has been fantastic. This progress has been due to research supported by public and private funds and to public interest in many cases. Within this brief period many new chemicals and weed control techniques have been developed. The development of the selectivity of herbicides, the introduction of the pre-emergence weed control, the development of pre-planting chemical methods of control, and the role plants play in changing the structure, activity, and selectivity of herbicides are only a few of the principal results of this research.

The use of herbicides, in some instances, is beginning to exceed the fundamental and applied research information available to insure their safe use. If a better balance between research in weed control and the use of chemicals is not obtained and maintained in the immediate future, the risk of damage to crops and all phases of the total environment will increase.

The adaptability of chemical energy for controlling weeds offers almost unlimited possibilities for improving the efficiency of weed control. Our future rate of progress will be largely deter-

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Pelleted Coastal Bermuda-New Feed For Southeast

By Eugenio E. Sanchez-A.,
Agricultural Engineering, '65

At a time when livestock producers, primarily in the Southeast, are striving to reduce the costs of importing livestock feeds from other parts of the country and at the same time increase their production, the pelleting of Coastal Bermuda grass has provided a new technique which could possibly be the best solution.

Coastal Bermuda grass is rapidly becoming the most important forage crop in the Southeastern states to the effect that more than 2,000,000 acres are annually grown in this part of the country. Compared with alfalfa—the most widely used crop in pelleting or wafering—pelleted Coastal Bermuda grass has proved to have about the same nutritional value. Furthermore, the crop can yield up to 10 tons per acre if proper fertilization and management practices are employed.

Pellets are small, cylindrical feed products made of finely chopped and ground material which are first dehydrated and then compressed into dense units ranging in size from 1/4 to 1/2 inch diameters. The compactness of the pellets has increased the efficiency of transportation, reduced waste in feeding, increased feed consumption, and improved the handling and storage facilities. Furthermore, the pelleting or wafering operations as compared with baling have made possible the complete mechanization of hay handling from windrow to feed bunk. Compared to baling, where much of the nutritional value of the crop is lost through the sun curing process, pelleting retains a higher percentage of the feed value (particularly carotene, which is the source of Vitamin A) through the dehydrating process which only results in the loss of water. Pelleting also permits the addition of concentrates which further increases the nutritional value of the feed and allows for the balancing of diets. On the other hand, pelleting has not gained acceptance when used as feed for dairy cattle because it apparently causes a slight depression in the butterfat content of the milk. The reason for this has not yet been determined. It is assumed that the fineness of the pelleting material might be the cause. In this case, wafered alfalfa hay which contains sufficient roughage is preferred.

A typical processing plant consists of a dehydrator, a hammmermill, and a pelleter. As with all new developments, the initial cost of a pelleting processing plant is high; and the ex-

(Continued on page 20)

4-H Club News

By Barry Wood

The Clemson College 4-H Club, organized on campus a few years ago, serves many needs. Clemson College students who had been active in 4-H Club work in their home counties wanted not to cut ties with an organization which had helped them to achieve a better adolescent life, but rather continue to play a role in the 4-H Club. Most of the Club's activities are on a local level; however, we do maintain contact and exchange ideas through members who attend regional or interstate conferences.

Our Club consists mainly of South Carolinians, but we also strive to include in our membership former 4-H'ers from other states who are presently attending Clemson.

The Clemson 4-H Club is active not only during regular school session, but also during the summer months. The club plays host to the young people who attend Farm and Home Week at Clemson every summer. Programs, socials, and other entertainment or recreation are presented by the coordinated effort of the extension service and the 4-H Club.

The Clemson 4-H Club prepares its monthly meetings so that many individual interests of the members may be satisfied. We have films, local speakers, 4-H delegates to foreign countries, and also programs prepared by the members themselves. As our membership increases and our financial status improves with each passing year, the Clemson 4-H Club strives for more coordination among agricultural clubs, and for a greater variation of goals and projects.

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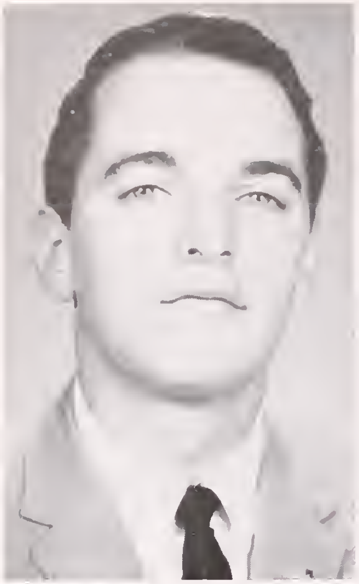


JAMES RALPH BALLINGTON, JR.

Jim Ballington, a major in Agricultural Education, is from Lexington, South Carolina. He is a graduate of Gilbert High School, where he was a member of the Beta Club. He is very active in the Future Farmers of America, having held chapter, federation, and state offices while in high school, and serving as chapter president at Clemson College. In addition he was chosen State Farmer in 1960.

Jim has served as managing editor of **The Agrarian,** is a member of Alpha Tau Alpha, Alpha Zeta, and the Student Agricultural Council of Club Presidents, of which he is reporter.

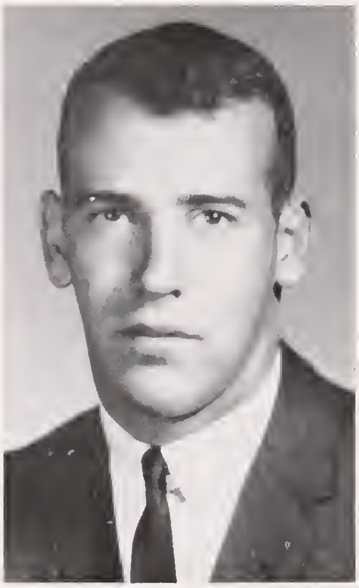
JOHN D. JOYE

Jake Joye is a senior in Agric
neering. He has been an energetic
astic worker and leader in many ac
willingness to take over committee
and do "behind-the-scene" work is
His accomplishments are notewort
academic and extracurricular activiti
point ratio of 3.41 is evidence of
ability. He is a member of Phi Kapp
Zeta, Gamma Sigma Delta, and Tau
has been a key figure in many unus
of the ASAE Student Branch. Jake
mar, South Carolina.

JOSEPH WILLIAM BARNETT

Joe, a native of Clover, South Carolina, is majoring in the Production Technology Option of Dairy Science. Joe's activities include chancellor of Alpha Zeta, secretary-treasurer of the American Dairy Science Club, second vice-president of the Regional American Dairy Science Association Student Section, and member of the college senate. He has received the following scholarships: Sears Roebuck, Ralston Purina, and South Carolina Dairy Association.

Joe was a South Carolina delegate to the National 4-H Conference in Washington, D. C. in 1960. At Clemson he is a member of Blue Key, Tiger Brotherhood, Advanced ROTC, and is listed in Who's Who Among Students in American Universities and Colleges. In addition he was on the freshman baseball team, and Dairy Cattle Judging team.



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Edited by

JIMMY MAXWELL CARTER

Jimmy Carter, born in Colleton County, South Carolina, is a senior in Agronomy. In high school Jimmy was Vice President and President of the Student Council, and also President of the Junior Class.

At Clemson he is an advanced military student, a member of Phi Eta Sigma, Alpha Zeta, Phi Kappa Phi, Gamma Sigma Delta, Blue Key, Kappa Delta Chi social fraternity, Kappa Alpha Sigma, and is listed in Who's Who Among Students in American Universities and Colleges.

Jimmy has been awarded the Alpha Zeta sophomore award and the Gamma Sigma Delta sophomore award for his outstanding work at Clemson.

This fall Jimmy plans to enter graduate school at the University of Illinois, concentrating on Plant Physiology and Biochemistry.

FRANCIS TILLMAN MA

Francis Tillman Mathias is fro
S. C., and is a graduate of Lexingtor
where he was student body presi
Farmers of America chapter preside
ber of the Beta Club. Tillman is ma
imal Husbandry and is a member
and Bridle club, Alpha Zeta, Colleg
of the Future Farmers of America, a
R.O.T.C. Tillman has a cumulati
2.67, and was holder of the Sears
Freshman Agricultural scholarship
is very active in the Block And Bric
ing participated on many committee
as vice-president for 1963-64.

MARION LeRON ROBBINS

Marion LeRon (Ronnie) Robbins is a Horticulture major from Chesnee, South Carolina. For his campus, regional and national activities Ronnie holds many honors including: cumulative scholastic record of 2.79; treasurer and president of the Horticulture Club; stewardship chairman of the Baptist Student Union; circulation manager and editor-in-chief of **The Agrarian;** president of the Association of Collegiate Branches, American Society for Horticultural Science; president of the Collegiate Branch, American Society for Horticultural Science, Southern Section; winner of the Joseph B. Edmond Southern Region and L. M. Ware National student horticultural research paper awards. In addition, Ronnie is a member of Alpha Zeta, Blue Key, Student Agricultural Council, Council of Club Presidents, and is listed in Who's Who Among Students in American Universities and Colleges.

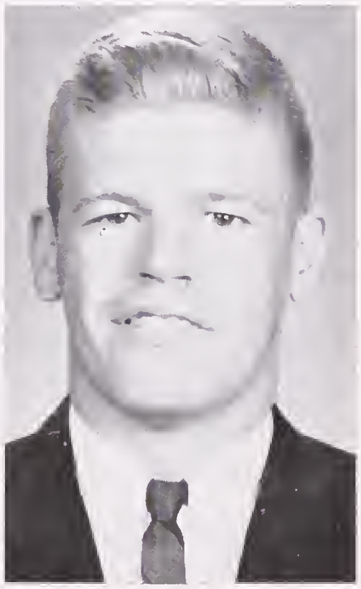
JON MARTIN ROGERS

Jon Rogers of Piedmont, South Carolina is a senior in Dairy Science and is specializing in Business. He is a member of the American Dairy Science Club at Clemson, Blue Key, Tiger Brotherhood, and Alpha Zeta. Jon has won many honors including the following scholarships and awards: Sears Roebuck, Coburg, Southern Ice Cream Manufacturers, Ambrosia Chocolate, and Virginia Dare. He is a Distinguished Military Student and has served as vice-president of the American Dairy Science Club at Clemson, President of Southern Region American Dairy Science Association Student Section, a member of the Dairy Products Judging Team, and is listed in Who's Who Among Students in American Universities and Colleges.

LUTHER WATERS, JR.

Luther is an Agricultural Education major from Batesburg, South Carolina. He is a graduate of Batesburg-Leesville High School where he was active in the local chapter of Future Farmers of America. In 1959 he was awarded the State Farmer degree by the South Carolina Future Farmers of America Association.

Since enrolling at Clemson Luther has been active as president of Alpha Tau Alpha; president of the Lutheran Student Association; vice-president of South Carolina, Georgia, Alabama Lutheran Student Association; secretary-treasurer of the Council of Agriculture Club Presidents; treasurer, vice-president and sentinel for the Collegiate Chapter of Future Farmers of America; and a member of Alpha Zeta. He is also a member of the Advanced Corps of the Clemson College Army ROTC.



Processing and its Overall Effect on Agriculture

By Lem Dillard, Agricultural Economics, '65

Processing is, in effect, manufacturing, and may be described as those operations in food and agriculture concerned with changing the forms of argicultural products. Processing has an important place in the farm marketing system. Processing is important in the preparation of food for human consumption, as we cannot consume most farm products in the form in which they come from the farm. This is clearly shown in the case of livestock products. The perishability of most farm food products gives rise to much of the processing of foods and this characteristic makes processing an indispensable part of those activities to be found in the moving of products from farms to the city.

A spectacular expansion has occurred in the processing of food products in recent years. Many new forms of food products are now available to the consumer such as have never before been seen in American food stores. The many new forms of processed foods include table-ready meats, canned citrus juices, frozen concentrate juices, prepared cake mixes, baby foods, pre-cooked frozen and canned vegetables and meats, instant powdered potatoes, and the frozen TV dinners.

Processing is not just an additional service to consumers as it has been in the past—it is now a highly competitive business and has had marked overall effects on all phases of agriculture. The recent trend in processing of foods has had marked effects on the prices of agricultural food products. These have been varied effects on the entire agricultural industry from the farmer-producer to the consumer.

In many cases the increased use of processed foods means the farmer can sell products he could not sell otherwise. Through the processing of foods, the farmer can dispose of lower quality fruits and vegetables that are not up to fresh standards. Processing may also help to increase the demand for farm products, yielding possible higher returns to the farmer per unit of the raw product. However, not all of the effects on agriculture have been favorable. The shift from fresh markets for food might have weakened the bargaining power of the farmer. The trend in processing tends to favor the farmer cooperatives and the larger farms as the markets for those processed foods demand large, uniform supplies of these processed foods. The small farmer is almost completely eliminated from these markets unless he markets his products through a cooperative or a marketing association of some type. This problem, however, is not altogether a new one created by the present trend in processing, as it has existed previously when chain stores began to rely more and more on the larger producer for their farm products.

This processed foods trend has also meant great fortune to some and misfortune to others, as out of it has arisen many areas of specialization in production. These areas have been specialized so much that the cost of production has been reduced enough to drive many of the smaller competitors out of business. These specialized areas also must have enough resources available to operate their processing plants. In many of the more remote areas, it is impossible for the farmer-producers to stay in their old business because of the lack of these resources. Many new problems concerning the choice of a new occupation or product have arisen for these farmers.

We begin to see how greatly these trends have affected costs and returns to the farmer when we take a look at four products which were chosen by researchers in their investigations of processing's effects on agriculture—lemons, snap beans, Florida oranges, and potatoes. The data was collected for the years 1959 and 1960.

Snap beans are a prime example of how processing can result in a shift in production areas. Oregon, New York, Wisconsin, and California produced 39 per cent of the processed crop in 1940-1949; but by 1960, their share was up to 55 per cent. of the total. Growers returns for snap beans marketed fresh amounted to $2.42 per bushel; snap beans for freezing—$1.69 per bushel; and

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Alpha Zeta News

By Joe Barnette

Alpha Zeta took in 11 members during second semester. They went through informal initiation on April 1 and formal initiation on the evening of April 6. The annual Spring Banquet was held on April 13, with all faculty members of AZ and their wives, plus the old and new members invited to attend.

AZ members have spoken to over 500 high school students through "Operation Contact." It is felt that this is one of the most worthwhile and important projects we could undertake since the majority of high school students are totally unaware of the vast career opportunities agriculture has to offer.

Plans are to distribute the teacher evaluation sheets again this semester prior to exams. Many favorable comments have been heard from both faculty and students concerning this project, and there is some expectation that the project will also be tried by groups from other schools on campus.

The South Carolina Chapter of Alpha Zeta attended the Southeastern Conclave at Gainesville, Florida, home of the University of Florida, on March 20 and 21. Chapters were present from Auburn, Florida, Georgia, Tennessee, North Carolina State, VPI, and Clemson. Clemson won the outstanding chapter award again this year. The award has been given only twice and the Clemson Chapter is proud to have received it both times.

At the request of all those chapters represented at the meeting in Florida, Clemson will be host to the 1965 conclave.

Changing Curriculum Of Vocational Agriculture

By Don Dempsey, Agricultural Education, '64

With the rapid change in agriculture in recent years comes a need for changing the curriculum in vocational agriculture on the high school level. Much of the emphasis, formerly placed on the students' supervised farming programs, is being shifted to agricultural sciences, importance of agriculture, management and farm mechanics. This is particularly true for the first-year or ninth grade students.

The new curriculum, broader in scope, contains more general agriculture and will appeal to a greater number of students. Farming programs will continue to be encouraged for students whose home farm situations provide the needed farm experiences.

Two additional features of the new curriculum are (1) placement of students on a good farm for learning experiences and (2) work experiences in agricultural occupations. This will benefit many vocational agriculture students who cannot carry out creditable farming programs on their home farms.

This is not to say that there is no place in vocational agriculture for the supervised farming program. It has long been recognized that learning to farm by "doing" is most desirable. However, with fewer people farming, the number of students who can have creditable farming programs becomes smaller each year. While the number of farmers decreases, the number of people needed to provide the necessary services in agriculture is on the increase. This new program will provide opportunities of learning about, and getting some experience in the many agricultural occupations.

Agriculture teachers think the new curriculum has many advantages. It should result in a broader knowledge of agriculture. Students will be familiar with non-farm agricultural occupations. Many students, who would not otherwise be eligible, can enroll in agriculture. A greater appreciation of the entire field of agriculture can be developed.

Many of our agriculture teachers in vocational agriculture are reflecting this idea in replanning their courses of study. Vocational agriculture today is being geared to meet the changing need in agriculture.

Processing And Its Overall Effect On Agriculture

(Continued from page 12)

snap beans for canning—$1.44 per bushel. However, yields averaged as much as 30 per cent more per acre in snap beans which were grown for processing. These higher yields were generally the result of more suitable production areas.

For lemons, the trend in processing has provided a great outlet for the expanded production of the last few years. In the 1950's, production almost doubled while the farm value of lemons dropped approximately one third. The amount of fresh lemons on the market is limited and the remainder of the crop must be disposed of through processing. Growers' returns ranged from $1.45 per carton of fresh lemons down to about 54 cents for the same amount of lemons used in processing. However, on the other end of the marketing chain of operations, retail prices were $7.00 for a carton of fresh lemons, $6.00 for an equivalent quantity of frozen lemonade concentrate, and $4.00 for single strength lemon juice. A good portion of the difference was in the cost of transportation of the lemon products. The cost of transportation ranged from 15 cents per carton of lemon juice to 91 cents for fresh lemons. Concentrate lemon products cost an average of 68 cents for transportation.

Florida oranges are a good example of processing paying off all the way down the line—to farmer, to marketer and to the final consumer. Concentrated orange juice prices were only a fraction of a cent less than the prices of juice made from fresh oranges during the 1959-1960 period. These processed orange juice products brought higher returns to the grower than did the fresh orange products. Florida growers got about 8.8 cents for oranges equal to 24 ounces of processed juice, and got about 6.8 cents for equal quantities of fresh oranges. The main reason for the success of orange processing is the lower transportation cost for the processed orange products. Also, the lower retail margins have made the orange processing business more successful.

Processing has increased the total consumption of potatoes. In 1956 only 15 per cent of the potatoes were processed, whereas over 25 per cent of the potato crop is processed today. This increase has meant an increased use of potato products. Processing potatoes caused a decline in the demand for fresh potatoes, but the increased use of processed potatoes has more than made up for the decline it created. Up until the time that processing of potatoes came into being decreased per capita consumption of potatoes was thought to be due to the increased per capita income of Americans which had altered their eating habits. This long term drop off has disappeared and has even risen slightly over the past few years due to this increased trend in processing.

This trend toward processed foods is more apt to increase than to decrease in the future, due to competition within the food industry. In general, a new form of processed food has the advantage on the grocery shelf only as long as it is new. When the shopper finds an even newer product, chances are she will buy it. This element of convenience to the consumer, which is a built-in property of processed foods, has tremendously increased the purchasing of these new processed foods. Thus, this encouraging jingle of the cash register should impel businessmen to strive to invent even newer and better methods of processing foods in the future.

The data used in this article was taken from **"Food Processing: Impact on Prices"** in the December 1962 edition of **The Farm Index.**

Poultry In The Past And Future

By John A. Thomas, Poultry Science, '65

In the poultry industry of the past each individual farm had enough poultry for its own use. Today poultry has become a very large and highly specialized industry. In past days, chickens didn't have a highly nutitrious diet as they do today. Corn was their main diet and was fed cracked, shelled, or on the cob. Table scraps, liquid skim milk, and wheat or oats were also fed to chickens because they were cheap and available. The nutritional value of these feedstuffs was not known at that time. As the industry advanced, other animal proteins were fed to chickens. During World War II soybean meal became important as a protein source, and more recently added fat has become an important supplier of energy.

Feed conversion has made rapid improvement along with the increased rate of growth of the birds. In 1927 it took about 10 weeks to get a 1½ pound broiler, whereas today, it takes only about 8 weeks to grow a 3½ pound bird.

The past and present in market quality of turkey meat are seen in this comparison of a wild turkey tom and a younger domesticated tom. The increased amount of white meat is a tribute to breeders who have brought about this change.

Formerly the practice was to let the chickens out on the ground for the daylight hours and put them in the hen house for the night, but today chickens are raised entirely in a house and are never let out.

The incubation of chickens has also advanced with the time. All chicks used to be hatched by putting eggs under hens, but today we have modern incubators that can hatch more chicks from the same number of eggs. These incubators are all automatic and are far more efficient than the hatching procedures once used.

Many chicken houses of today are automated. On the most modern egg farms, the eggs are never touched by human hands until the housewife takes them out of the carton. We also have high-density environmentally controlled houses where the temperature can be kept constant all year round for better growth, livability, and egg production.

Today it is not uncommon for one man to take care of about 40,000-50,000 broilers or 10,000-15,000 hens if he has highly automated equipment. The poultry industry of today is a highly mechanized and specialized industry, and the man who is not willing to stay modern and keep up with the times had better make plans for another business.

Pre Veterinary Club News

By Pete McCoy

The Pre-Veterinary Club has planned an active schedule for the Spring semester. This is the semester that Sophomores, Juniors, and Seniors who have met the requirements to enter the Veterinary School at the University of Georgia are selected to enter the University of Georgia in September of 1964. Ten students will be selected from South Carolina this year. This selection is based on scholastic achievement, personal interview, and scores on an achievement test which was given during February.

The club has planned to visit the open house at the Veterinary School in Georgia during April. This will give each prospective student a chance to see the Veterinary School.

A banquet has also been planned for this semester. The banquet will be in May during which the club officers for the following year will take office and take over the activities of the club for the rest of the semester. This banquet is the highlight of the club year.

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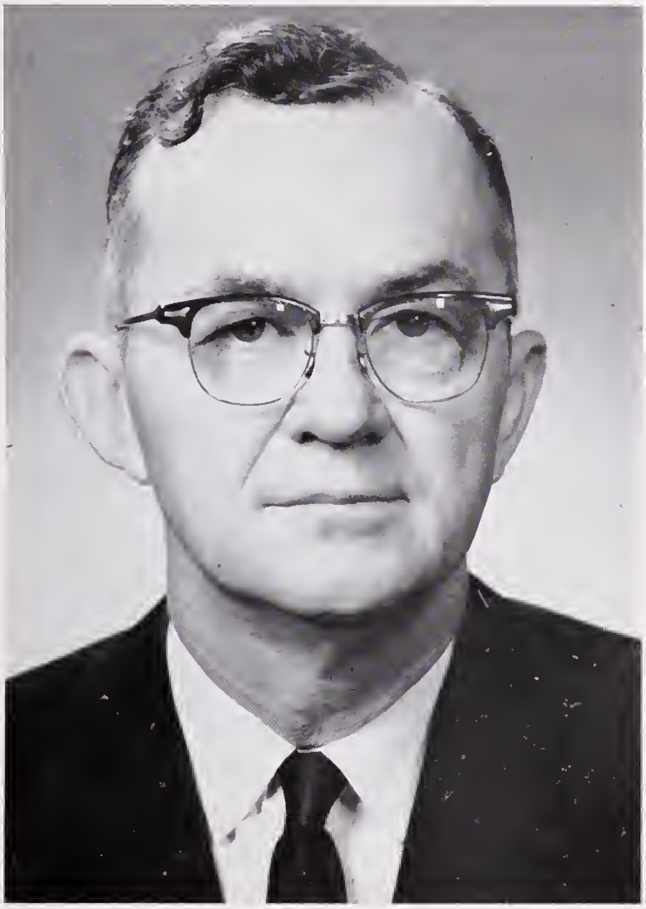
SUCCESS AND SERVICE

A PROFILE OF DR. J. W. JONES

By Kenneth K. McDaniel, Feature Staff

The Agrarian proudly introduces the first in a series of articles recognizing outstanding leadship and teaching personnel in the School of Agriculture at Clemson University. This season's profile is of Dr. J. W. Jones, Director of Agricultural Teaching, and Professor of Agronomy.

Dr. Jones was born on a farm in Greenville county and was graduated from Mauldin High School in 1931. He entered Clemson in 1933 and graduated with a Bachelor of Science Degree in Agronomy in 1937. Having received the award given to the senior with the highest cumulative scholastic record and the Anderson Fellowship for graduate studies, he entered Cornell University Graduate School. In 1938 he received his Master of Science Degree, and later re-entered and completed requirements for a Ph.D. degree in Genetics and Plant Breeding.



DR. J. W. JONES

Dr. Jones took a brief pause in his stimulating career to serve as an infantry officer in the U. S. Army from 1942 until 1946.

Other than his military service, all of Dr. Jones' employment has been with Clemson. After serving as Assistant County Agent for a year in 1938, Dr. Jones entered Clemson again as an Instructor in Agronomy. He has now his full professorship and, because of administrative ability, he has been appointed Director of Agricultural Teaching. Because of these administrative responsibilities his teaching is limited to Agriculture 101, an introductory course for freshmen. Despite his limited teaching, Dr. Jones' heart is still behind the lectern in a filled classroom.

Dr. Jones is a member of Alpha Zeta, Phi Kappa Phi, Sigma Xi, and Gamma Sigma Delta fraternities. He is also a member of the Anderson Rotary Club and Clemson Baptist Church, in which he is currently serving as Deacon. Dr. Jones is also an active member in the local division of the United States Power Squadron. His hobbies, other than boating, include hunting, fishing, and gardening.

In recognition of his outstanding contribution to the instruction of students at Clemson University and to the field of agriculture, **The Agrarian** proudly presents this story of the Success and Service of Dr. Jess Willard Jones, Professor of Agronomy, and Director of Agricultural Teaching.

Have You

(Continued from page 7)

assistant county agent.

In the large counties where two or more assistants are empoyed, the agent may retain his scientific identity by concentrating his efforts. In other situations generalization is unavoidable. Graduate work provides the opportunity to specialize, and there are openings from time to time at the state level for specialists in all of the disciplines. These positions are coordinated with the subject matter departments and most specialists are headquartered at Clemson.

Subject matter or commodity agents are being employed to assist county agents in two or more counties. For example, we have an area agent— horticulture— to serve Charleston, Colleton, Beaufort and Jasper Counties.

It is inappropriate to spell out working conditions, salaries, etc., in this article. But let me say in closing that we are always interested in able men who wish to make Extension work a career. It is also a wonderful place to gain valuable experience for a career in research, resident instruction, industry or farming. We hate to lose good men, but anticipate that some employees will seek greener pastures.

The ultimate in county work is to become county agent. He is the leader of the total program. The position associate county agent has been established in most of the counties for the promotion of assistants who have met certain requirements.

We have a fine staff of able, dedicated employees. If you wish to know more about the Service and possibilities of employment, I suggest that you talk with your department head, extension specialists, our district agents or stop by my office for a visit.

Milk Packaging In The Dairy Industry

By Lloyd M. Kapp, Dairy Science, '65

The development of the dairy industry has evolved from milk being secured from the "family cow" into a complex system of milk being delivered in an attractive sanitary package. The first packages for milk were large wooden buckets delivered to the door of the consumer.

The use of glass bottles was probably the first major improvement in packaging milk. The bottle with the "lightening tops" was the most common type when milk bottles first came into use. The closure had a flat tin disk with a paper gasket held against the mouth of the bottle with a wire bail actuated by a wire lever arrangement. The wire was permanently attached to the bottle. In 1889 the first so called "common sense" bottle was manufactured and this is the most commonly used glass container of today. A stiff paraffined fiber disk seated into the recessed area of the mouth of the bottle serves as a closure. More recent ones use laminated aluminum foil caps to cover the pouring lip of the bottle.

The first use of glass bottles had some opposition by consumers, apparently because they associated this method with dispensing medicine. It took a period of years before bottles came into general use. Even during the early 1900's milk was distributed in bulk and measured into the consumer's vessel. Between 1910 and 1920 pasteurization and the regulation of milk supplies in the interest of public health became quite general, and more cities made it compulsory to deliver milk in sealed bottles.

Milk in glass bottles makes an attractive package. With the emphasis in early years on the creamline of milk, glass showed this characteristic to good advantage. The consumer began to associate quality of milk with the depth of the cream layer. With the advent of homogenization the creamline of milk began to lose its appeal. This was one factor which made it possible to use packages of less transparency.

The outlet for dairy products as with other food products shifted from the corner grocery store to the retail super-markets. With this new way of merchandizing, self-service and check-out counters, it was difficult to get stores to keep up with returned glass milk bottles. Unless empty bottles are returned, it is too costly to package milk in glass. A new package was sought for handling milk in the super-markets. A paper container was the new package for milk. The paper carton was suited to this new way of merchandizing as no deposits were required, no bottles had to be returned, and the store manager did not have to bother with refunds as it was a one trip disposable container. The package was designed for ease of handling; it made an attractive unit, and dairies could use the side walls for advertising. One disadvantage in the carton was that it had to be wax coated. Occasionally flakes of wax would get into the milk causing complaints. The disadvantages of using waxed paper cartons caused the development of a plastic coated paper container. Because of its better quality almost all paper milk containers are now of the plastic coated type.

There are many different sizes of milk cartons in use by the industry. They range from half- pint to gallons with all the in-between sizes. The half-gallon carton is usually the most popular size for use in the home. Gallon jugs made of glass are being used in some markets. Also bulk containers (three, four, five or six gallon sizes) made of plastic liners within a cardboard box are used for delivery of milk to homes as well as to institutional trade. These types of containers appeal to the economically minded consumer.

A new type design of paper container is the "Tetra-Pak." It is made of plastic coated paper and formed in the shape of a tetrahedron. Its main use at present is for supplying a market that requires a package for individual servings of milk and fluid dairy products. The most recent development in containers for milk is the use of plastic. Plastic gallon jugs are being test-marketed in many areas including markets in South Carolina. If this plastic jug is accepted, then more plastic containers of all sizes will be introduced.

The dairy industry is a dynamic one. The use of different containers is just one of its many facets. The dairy industry is forever seeking ideas and developments and improvements in marketing nature's most nearly perfect food.

Farm Of The Future

By Bill Whitfield, Feature Staff

Let us never forget that the cultivation of the earth is the most imoprtant labor of man. "When tillage begins," said Daniel Webster, "other arts follow. The farmers, therefore, are the founders of human civilization."

It has been said that nature is the most thrifty thing in the world; she never wastes anything; she undergoes change, but there's no annihilation, the essence remains matter is eternal.

Agriculture is a part of nature and very much like nature. It must undergo change and there is no annihilation if the civilization of this world is to survive.

It must undergo change. Keeping this in mind let us reach into the future and picture farming of the year 2000 A.D.

If we were flying over a farm in the year 2000 A.D., it might appear much like a huge plastic greenhouse, but the size and the processes that go on inside are far greater than any processes on the modern farm of today.

The field proper of this farm of the future consists of one 50 acre plot. Adjacent to the field is located the farm home constructed of plastic or of some refined synthetic. Both the field and house areas are covered by a clear plastic bubble with a rectangular base. This huge bubble has no supporting structure and is supported solely by air pressure. Air for supporting the covering and production of a controlled climate under the covering is supplied by large ducted fans, located around the base perimeter of the bubble. Climate is controlled by air temperature and humidity conditioning electrical units powered by solar energy cells.

Energy for operation of the farm equipment is supplied by using a very large solar cell connected to a huge underground battery storage plant. By using artificial lighting, the crops' exposure to light could be controlled, thus possibly increasing yields.

All cultivation, harvesting, irrigation, etc., is done automatically with equipment attached to a large movable truss which spans the full width of the field. If a processing plant is needed for the crop, this also can be supported on the truss, and the end product would be ready for the consumers of agricultural products.

This power truss is one of the most unique features of this farm of the future. It replaces the tractor—doing all jobs from breaking the land to harvesting. This power truss is remote-controlled from a central power station.

The farm family that occupies this farm house would have a vacation in itself. The farm home is located under the dome and therefore free of dust, weeds and insects.

Land is a many splendored thing. To some, it is soil—how many bushels of corn will it raise? To others, it is a small piece of the earth's surface, rare as a gem, something to be cherished and enjoyed like an old masterpiece. To still others it is space, something on which to build a home, a shopping center, an apartment.

To the farmer, land is the means of his survival. But agricultural land is dwindling because of the increased acreage which the ever-expanding population requires for other uses. To overcome this factor, the farm of the future will have to produce more on less land. This is going to require more efficient use of the land we have, better labor efficiency, and more economic use of all of the resources of our land.

Agriculture must undergo change to keep up with the changes of the world of today.

Perhaps this farm of the future seems far fetched today, but tomorrow the farm of today will be obsolete. This farm is not just the idea of one person; it has been carefully thought through by agricultural engineers at Texas Technological College at Lubbock, Texas. A model has been erected of this farm.

Our rapid growth of agricultural productivity has strengthened the favorable terms on which we and the world have had access to agricultural

(Continued on page 21)

Block And Bridle Club News

By Jim Heselbarth

This spring the Clemson Block and Bridle Club sponsored a meats judging team, coached by Dr. George C. Skeley, Jr., which took part in a meats judging contest at the University of Tennessee. This contest was open to all boys not having previous judging experience in meats.

On March 21 the Block and Bridle Club held its annual spring barbecue at the annual White-Orange spring football game.

On April 23 through the 25th the club helped sponsor the Southeastern Intercollegiate Judging Contest. Members of the club helped get the sheep, swine, and cattle ready for the evaluation contest on Thursday, April 23 and the judging contest on Friday, April 24. The club and the Animal Science Department were hosts to approximately 17 teams from the Southeast. After the intercollegiate contest the club sponsored a judging contest for 4H and FFA boys from throughout the state. Approximately 60 teams took part in this event.

The club activities for the year will close with the Block and Bridle Club annual banquet. At this banquet the Merit Trophy will be awarded to the outstanding senior club member. Tom Bell of Orangeburg was named the club's 1964 honorary member. The Block and Bridle Club is concluding another successful year of activities which have included sponsoring trips of the meats and livestock judging teams, two barbecues, and scholarships to two outstanding juniors, George Dorn and Dan Bozard.

Fruit: A Potential Processing Crop For S.C.

By Alton Keller, Horticulture, '64

The processing industry in South Carolina is very small. Yet the trend in the United States is toward the consumption of more processed fruits and vegetables. Today about one-third of our nation's 43 mililon married women work in contrast to about one-fourth 20 years ago. These women are demanding foods which can be prepared quickly and easily to serve to their families. Americans are also dining out at higher rates than ever before. This dining out market amounts to a 23 billion dollar per year business. The restaurants that are serving these meals are demanding and getting processed and prepared foods which are quicker and easier to serve, and on which cost per serving can be quickly and easily determined.

A look at some of the latest statistics reveals that we consume about 92 pounds of fresh fruit, 23 pounds of canned fruits, 13 pounds of canned juices, 3 pounds of dried fruits, and 8 pounds of frozen fruits per person per year.

A closer inspection shows South Carolinians each year consuming 14 million pounds of berries, 4 million pounds of pears, and 1 million pounds of plums in the canned and frozen category.

Only a small proportion of South Carolina's fruit crop is processed in the state, the main fruit crops being peaches and grapes. Five years ago about 10 million pounds of peaches were processed, while in 1963 it was 25 million pounds. The grape industry is small with only 1800 acres, predominantly bunch grapes, grown in the state. Most of these go to the juice plants.

A look at peaches shows that this fruit continues to be the nation's most popular canned fruit, increasing its production to three to four times that of 10 years ago. Yet this still remains less than 5% of the nation's total canned peaches. Part of this lag results from varieties grown, technical problems involved in processing freestone peaches, and certain federal standards.

About ninety per cent of the frozen peaches are sold in 30 pound tins to institutions such as hotels, bakeries, etc. South Carolina is not getting its share of this 60 million pound market.

Other fruits which have potentials for processing in South Carolina are apples, pears and small fruits.

Most of the commercial pear production has been concentrated on the Pacific Coast. The bacterial disease fire blight has been responsible for a scarcity of pear orchards in the Great Lakes states. A commercial baby food processor is sponsoring a research program at Clemson searching for ways to successfully grow pears in South Carolina. The demand for pears for processing is excellent, but at present the state only has 400 acres.

Within the state there are a number of commercial plum plantings, some of which are large enough to supply processors. The potential plum production has not been explored to the fullest. Also certain processors are interested in securing a source of Stanley prunes.

One fundamental reason for the undeveloped state of the canning industry in South Carolina has been the shortage of high-quality raw materials. The explanation of this lies in the fact that South Carolina specializes in the production of fruit for the fresh market. It should be noted at this point that processing is not a solution to poor quality fruit culled from this fresh market.

There are wide differences as to why the processing industry has not developed to a fuller extent in South Carolina. Some obstacles that have to be overcome are poor grower-processor relationships, low quality of the processed product, lack of initiative in marketing, lack of capital, and the fact that canners are operating at less than capacity. South Carolina has the potential for increased processing with climate and soils favorable for fruit production and growers with the technical know-how to grow quality fruits and the desire to increase fruit production to meet processing demands. South Carolina is beginning to meet the challenge for the tremendous potential for processing in the state.

Kappa Alpha Sigma News

By Pat Hunt

The Agronomy Club (KAE) started off its new semester with the election of new officers for 1964. The following were elected: President, Tommy Hart; Vice President, Joe Ben Weeks; Recording Secretary, Pat Hunt; Corresponding Secretary, Ben Morton; Treasurer, Jimmy Hiers; Junior Advisor, Dr. C. E. Bardsley.

Julius Faber, a graduate student from Holland, spoke March 3 on the geographics of Holland, and on the differences of Holland and American universities.

Dr. U. S. Jones, Head of the Agronomy and Soils Department, spoke to the Club on the subject "The Future of Agriculture—Especially the Agronomic Aspects Of It," on March 17.

Ben Morton is obtaining some slides from KAE on the activities of the different clubs in the nation. These will be shown at one of our meetings this spring.

The Club took a trip to Charleston, South Carolina on the weekend of April 17 and 18. We toured the grain elevator at the Charleston Port and the American Agricultural Chemical Company.

We had a steak supper on April 28 in honor of the senior members of the Club. Professor "Frosty" Bauknight was guest speaker for this occasion.

Freeze-Drying Of Foods

By Ralph S. Lewis, Food Technology, '65

Since the beginning of time, man has been searching for new and better ways to preserve his food. Today, one of the noticeable developments in food preservation is the renewed interest in freeze-drying.

Freeze-drying is not a new method, as it was used twenty years ago for the preservation of biological materials including blood plasma. The reason it has not been used more extensively in the food industry is the high cost involved. With new innovations, however, the cost has been reduced somewhat, thus giving rise to increased application in the food industry.

The freeze-drying method, as the name implies, combines the advantages of preservation by freezing and by drying. The moisture is removed from the food without appreciably changing the shape, color or taste of the product. With the water removed, the food can be stored for long periods of time without refrigeration. The freeze-dried product loses substantially all of its moisture in the process. Reconstitution is accomplished by simply adding water and allowing a short time for the original amount of moisture to be reabsorbed by the food.

The first step in freeze-drying is the preparation. The food may be processed from cooked products or raw products. Some products may need to be sliced, diced, granulated, powdered, or liquefied in order to keep the freeze-drying time to a minimum. The food is then frozen quickly. This results in the formation of small ice crystals which will not cause rupturing as much as large ice crystals. After the food is frozen, it is placed on trays which hold two to three pounds of products per square foot. The trays are placed in a freeze-dry cabinet from which the air is then pumped out to lower the pressure. At low pressure the water is removed from the food product by sublimation. Sublimation is the process in which the ice crystals in the food change to a vapor without passing through the liquid state. Heat may be applied to the product to hasten sublimation. After the product has lost substantially all of its moisture, it is considered freeze-dried. The cabinet is backed-flushed with nitrogen, and the product is then packaged. Packaging must be done in a container that is moisture-proof and air proof. Oxygen should not be allowed to come in contact with the product because of undesirable oxidation of fats and other food components that may cause damage to the flavor and color.

Today the most important application of freeze-drying appears to be in the meat industry with products such as beef, pork, chicken, and fish. Pieces of meat that are about one inch thick can be freeze-dried readily. Thus, steaks, chops, and fillets are especially suited to the process. Another important application of freeze-drying is to preserve the various ingredients of dried soup mixtures. Such ingredients, when rehydrated, provide natural color and flavor in soups.

Various fruits and vegetables have been freeze-dried on an experimental basis. These products, while having good quality, do not yet justify the higher costs invoved in comparison with present methods of preservation.

The advantages of freeze-drying are in improved quality and color of products and in lower storage and transportation costs. If costs of producing freeze-dried foods can be reduced further, it is likely that they shall become more common on the supermarket shelves.

Food technology major Dona Hallum places fruit in the freeze-drying unit used for preparation of freeze dried foods in the laboratory.

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The Economic Importance Of Timber

By Danny Lamb, Forestry, '64

The nation's economic activity is measured in two widely accepted ways—gross national product and employment. Few people realize the important role that the timber industry plays in our country's economic activities. Let's first look at the effect the timber industry has on the gross national product . . . the market value of all goods and services produced in the country. In 1958, the sum of all the values of goods and services of the timber industry amounted to 25 billion dollars. This represents nearly 6 per cent of the nation's gross national product. In other words, one dollar out of every 18 dollars of the gross national product originated in some kind of timber - based economic activity. These figures are comparable to practically every industry in the United States.

In 1958 employment attributed to timber in all timber-based industries amounted to the equivalent of 3.3 million people. This represented better than 5 per cent of the total civilian employment in the United States—and meant that one out of every 20 employed was engaged in some kind of timber-based economic activity. Again, these figures can be matched by few other industries in the United States.

Fortunately the forests are renewable resources and will continue to play their important role in the nation's economy . . . if wise management practices are followed. In the last few decades the forest management programs of public agencies, forest industries, and many private landowners have expanded rapidly. As a result, most of the timber now cut represents in some degree the product of management.

Only through the practical application of science, technology, and economics will the timber industry continue to grow and provide for this country its most valuable. asset.

Pelleted

(Continued from page 9)

pected returns are not sufficient when based on production alone. But, savings can be made in handling and storage costs and in the reduced waste.

In order to determine the operating characteristics of a processing plant for the production of pelleted Coastal Bermuda grass as an aid to livestock producers and future investors of this state, a team from the South Carolina Agricultural Experiment Station has conducted research in the establishment, fertilization, cutting, and maintenance of the Coastal Bermuda grass crop as well as in the energy requirements of the processing operation.

As noted above, the advantages in using pelleted feeds are many. That pelleting and wafering machines will replace balers in the near future is perfectly feasible. The climatic conditions in South Carolina are almost perfect for Coastal Bermuda, a crop adapted to the sand and clay sub-soils found in this state.

Once again research in science and engineering has come forth with a possible solution to feed processing. But research alone cannot do the job of increasing production. It is up to individual initiative to achieve the goal of full scale production of pelleted feeds.

ASAE News

By Joe Brown

The ASAE had a cotton project this year through which were procured funds for financing the activities of the club which include: The Georgia Banquet, the field trip, and the safety program.

Several senior members attended the South Carolina Section ASAE meeting in Columbia. The theme of the meeting was "Engineering Efficiency — A Foundation for Profitable Agricultural Business." Among the topics covered were: Opportunities and Problems of Farm Equipment Merchandising; Opportunities of Farmstead Systems Engineering; Problems of Conservation Contracting; Making Mechanization Manageable; Opportunities for Treated Wood in Farm Structures Contracting; and Meteorology—An Aid to Mechanization Efficiency. The afternoon of the second day of the meeting included a tour of the Parr Schools Nuclear Plant.

The ASAE has promoted a safety project to initiate the adoption of a standardized slow moving vehicle recognition sign in the Southeast. This sign is of a triangular shape and is easily recognizable day or night. Its purpose is to instantly inform drivers that a slow moving vehicle is ahead.

The ASAE has been fortunate in having exceptional programs and speakers such as Mr. Nutt, Director of Agricultural Extension Service, who spoke on the European Foreign Market and Its Potential as a Market for United States Goods; and Mr. Garner, Engineer in Charge of the USDA Southeastern Cotton Ginning Laboratory, who spoke on Agricultural Research Service and Its Work.

The annual Clemson-Georgia banquet was held on April seventeenth. This year the Clemson Chapter of ASAE was host. Steaks were enjoyed by all after which Mr. Finch of the Texize Corporation in Greenville presented a very enlightening speech.

The Clemson Chapter of ASAE went on a field trip the latter part of April. This included a visit to the National Tillage Laboratory at Auburn, Alabama. After this, the club traveled to Albany, Georgia, where they visited the Lilliston Implement Company.

Two new members, Carl Brown and Jim Gibson, were inducted this semester, bringing the student membership to twenty.

Clemson ADSA News

By Gene Merritt

The members of the Dairy Club feel that we were indeed fortunate to have Miss Sue Ann Godderidge, the American Dairy Princess, with us during homecoming weekend. Sue Ann was escorted by Larry Gause and Gene Bennette during her stay, and her visit was covered by press, radio, and television. Also during homecoming activities the Dairy Club prepared a very attractive display.

The December 10 meeting of the Dairy Club was held in the lobby of the Food Industries Building for the formal initiation of new members.

The Clemson Dairy Club is now under the capable leadership of a new president. Serving as the newly elected president is Jimmy Williams, with Shuler Houck serving as vice-president and Gene Merritt as secretary-treasurer.

Jimmy Williams, Shuler Houck, Jon Rogers, and Gene Merritt, along with Club advisor Dr. J. T. Lazar, attended the Southern Agricultural Workers Convention in Atlanta, February 3 through 5, 1964. The members were very pleased to talk with Dairy majors from other schools and exchange ideas and opinions. Gene Merritt was elected president of the Southern Student Division of the American Dairy Science Association.

The Clemson Dairy Club meetings are now announced by the "Bull Boards" prepared by past president Larry Gause. Plans are now being made for charts to be placed in various locations giving a nutritional comparison between several favorite drinks and milk.

The Dairy Club's year is highlighted by a banquet. At the banquet various awards are given to outstanding students. The banquet was held on April 28 this year.

All members of the Dairy Club were certainly saddened by the recent death of Mrs. B. E. Goodale. We extend our sympathy to Professor Goodale and his family.

Chemical

(Continued from page 8)

mined by the discovery and development of more selective, more specific, better formulated, more efficient, safer, and more economical herbicides. A better understanding of the limitations will determine the potential development of new and more effective control techniques. This, in turn, will help determine the effectiveness of man's never-ending problem with weeds.

Farm Of

(Continued from page 9)

raw materials, and has made available an increasing share of the national labor force for nonagricultural employment.

In turn, we, the people in agriculture, must look into and think about the FARM and the FARMER of the FUTURE.

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Horticulture Club News

By Dale Brown

This year the Horticulture Club at Clemson has been fortunate to have had many interesting and rewarding moments on its agenda. Some of the most interesting were: the twice a month meeting, at which different well-known speakers spoke on different aspects of horticulture; the annual trip to the Southern Agricultural Workers Convention, which was held in Atlanta, Georgia; the many projects such as the selling of jelly to finance the Atlanta trip and the selling of coleus plants to help finance next year's convention which is to be held in Dallas, Texas, and also private trips on the part of some of the members to such places of horticultural interest as Callaway Gardens at Pine Mountain, Georgia, and the Southeastern Flower and Garden Show at Charlotte, North Carolina.

At the Southern Ag. Workers Convention in Atlanta this February 2, 3, 4, and 5, the Clemson Collegiate Chapter of the A. S. H. S. had more than twice as many members present as any other school. Aside from everything learned at this convention, many influential people were met by everyone, and even if the president of the collegiate branch doesn't come from Clemson next year, as it did this year in Ronnie Robbins, we did manage to get Maurice Ferree elected as vice-president.

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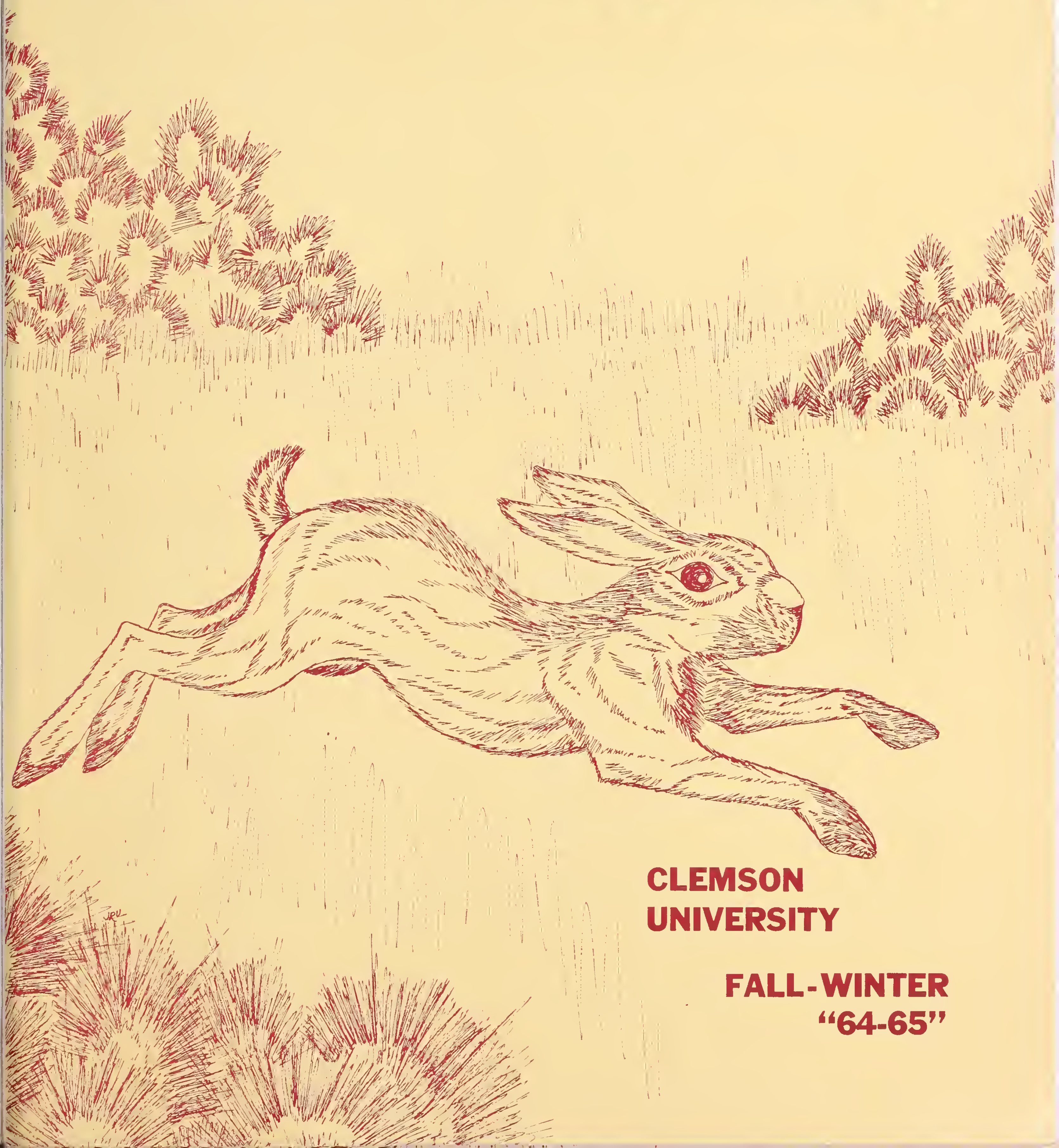

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THE AGRARIAN

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THE COVER

The cover shows one of the many forms of wild life found in South Carolina — the cottontail rabbit. Very few states offer the variety of game species which South Carolina has. From the white-tail deer of the coastal plains to the quail of the piedmont, the hunter can choose the type of hunting he enjoys most. See page 11 for a fine article on South Carolina hunting. The cover was drawn by staff artist Bob Upson.

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UNDERGROUND WAR

C. T. Mathews, '65, Biological Sciences

Right under your feet day and night there is a war going on. Today, in a world of conflict, you want to know at once: Where is this battlefield? Who are the participants? What are the issues involved? Who are the "good guys" and the "bad guys"?

Almost since life began, this war has been fought, and yet most of us are not even aware of it. This is a war of survival—a war for "food." It is unique in that we can't see most of the individual participants without the aid of a microscope even though we may see the results.

These microscopic armies, called microbes, exist in almost every square inch of the earth's surface and in the air surrounding it. We are concerned here only with those microbes that live in the soil. These microbes, like other living things, must continuously have "food" or nutrients at their disposal in order to grow and reproduce. But obtaining these nutrients is not always easy, since there are so many different species competing for a relatively limited supply of nutrients. For instance, an average number of microbes in the surface layer of a typical mineral soil is about 12 x 10.6 or 12 million per gram of soil. This is broken down in Table 1.

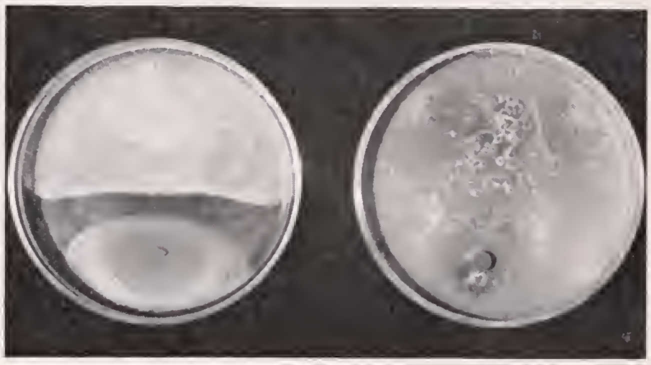
Table 1. Organisms per gram of soil.

Bacteria	9,750,000
Actinomycetes	2,080,000
Fungi	119,000
Algae	25,000

Just looking at these numbers it is hard to conceive that all of these microbes could survive and reproduce without interfering with each other.

Because of this competition for a limited nutrient supply, some microbes have become especially adapted to survival and the obtaining of food in this competitive society. Sometimes this adaptation is due to an antibiotic which the microbe secretes into its environment. This antibiotic inhibits the growth of other micro-organisms and thus reduces competition in laboratory cultures, and presumably does the same thing in the soil.

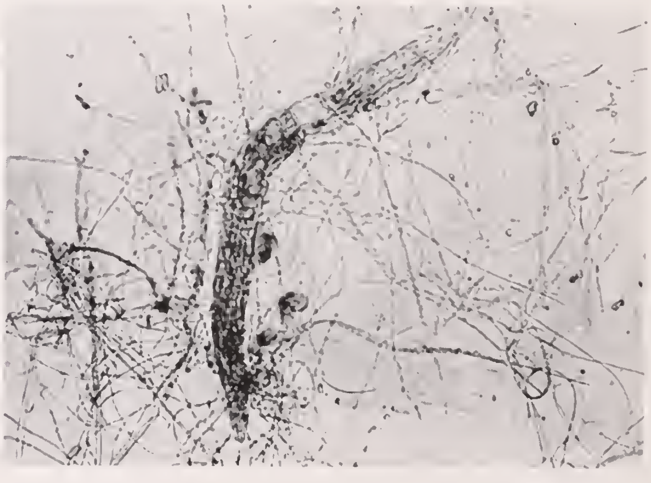
Actinomycetes are well-known producers of antibiotics, such as streptomycin and aureomycin, which are used as human medicines. There are many species of bacteria, fungi, and actinomycetes in the soil that synthesize antibiotics which inhibit the growth of their microbial neighbors. Such an example of antibiotic production is shown in Fig. 1. In the plate at the left the growth of the fungus **Fomes annosus** (top) has been stopped by an antibiotic secreted by the dark-colored fungus **Penicillium. Fomes annosus** causes a root disease of pines and other coniferous trees in many parts of the world. It appears to be very sensitive to antibiotics, and it is sometimes impossible to get a pure culture of the fungus from soil.



Work with **Fomes annosus** has been going on for some time at Clemson University. Figure 1 was taken during a study conducted in 1963 by Thomas Adams, Forestry senior, and Wesley Witcher and Carl Lane of the Experiment Station staff, to determine if there was a relationship among numbers of fungi, bacteria, actinomycetes, and/or nematodes and pines diseased by **F. annosus.**

Sometimes one microbe may actually prey on another microbe. In this case the predator actually destroys or kills its victim. This is illustrated in the dish at right in Fig. 1 where the fungus **Trichoderma,** which was started at the lower edge of the dish, has destroyed the colony of **Fomes** which was started at the top of the dish. This is not the case where antibiotics are concerned. The antibiotics, mostly, inhibit growth and/or reproduction of the competing species.

As another example of the microbe which destroys its victim, we will consider the attack of the fungus **Dactylella** on nematodes. This fungus produces doughnut-shaped spores in abundance in the soil. When a nematode squirms into the loop of the spore, specialized appendages digest the nematode slowly (Fig. 2). Last spring Miss Harriett Lipscomb, a graduate student in Plant Pathology, studied this type of fungus-nematode relationship.



The attack of special viruses, called bacteriophage, on bacteria is another example of antagon-

(Continued on Page 15)

PESTICIDE RESIDUES—NO PROBLEM

Lucian B. McCutchen
Department of Agronomy and Soils, '65

The American public is equipped with a giant rubber stamp carrying the inscription "bad" which it immediately grasps when words such as "fall out," "water pollution," or "pesticide residue" are mentioned. People tend to group all new and little understood problems into one category which they regard with awe, mysticism, and skepticism. This is largely due to a basic distrust of the unknown, and the overemphasis, by the press, of a few accidents involving new chemical products. Most people will not try to understand and learn about a new problem. Many are perfectly satisfied to be scientifically illiterate.

The problem that this article pursues is soil pesticide residues. Rachel Carson approached the problem from the standpoint that the modern chemical farmers are upsetting the "balance in nature" and fixing a path for destruction. In the words of Mark Twain "a lie can go around the world while the truth is putting on her shoes." The other extreme approach is to say that there is nothing to be concerned about at all. The actual truth is located somewhere between these two extremes. All adverse publicity concerning pesticides has not been detrimental. The public becomes emotional about health hazards and this has been reflected in legislative appropriations. It has resulted in increased funds for study of the problems concerning pesticides and has pushed upward the rate of research in this field.

Pesticides have come into wide usage during the past twenty-five years. Due to its recent origin, no distinct science concerning pesticides has yet developed. A worker in the area of pesticide residues has to be trained in organic chemistry, soil chemistry, microbiology, plant physiology, and a number of other fields. Pesticide residues present a complex problem.

The soil is a dynamic system composed of chemical and biological fractions; each soil having its own unique set of characteristics. Modern pesticides are mainly complex cyclic organic molecules with various functional groups attached to give specific effects. The way that a soil will react to a specific pesticide is dependent on the conditions of that soil. The reaction is controlled by soil pH, salts present, moisture content, organic matter content, the amounts and types of clays present, and many other variables. An ideal pesticide (insecticide, herbicide, fungicide, or nematocide) would do its job and then disappear; however, almost anything that completes its job brings about some side effects. A pesticide, when introduced into a soil can be leached out by rain, be absorbed on soil surfaces, be decomposed by sunlight, persist as a problem, or possibly be detoxified by soil micro-organisms. Much of the research presently being carried on is oriented in the direction of trying to find out the final fate of these compounds. The main desire is, in the future, to have enough facts compiled concerning soils and pesticides to predict the behavior and fate of a given pesticide when it is introduced into a particular environment.

One of the common public misconceptions is that the farmers are contaminating our foodstuffs with chemicals, and that there seems to be no control over what they drench our "apples and oranges" with under the present government regulations concerning pesticides. The chemical producer has to prove that there are no harmful side effects produced from his chemical. In the past the manufacturer did not have to prove that the chemical brought about the control that he claimed. Before a new pesticide reaches the publiclic market, several hundred thousand dollars have been spent on research with the chemical. Union Carbide spent $1,500,000.00 in research, used 1,900 test animals, and had 43,000 pages of laboratory reports invested in the insecticide Sevin (mythyl-napthylene) before it was cleared for general usage. Most of the over-emphasized accidents with farm chemicals have come about through their mis-usage. There have been very few reports of toxic effects from properly directed usages. When a "layman" sees a farmer spraying his soil and crops with several hundred gallons of insecticides, he does not realize that the amount of active ingredient in the spray solution is used at the rate of only a few pounds per acre. The average weight of the cultivated

(Continued on Page 19)

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SUCCESS IS HIS STORY

Bill Plaxco, Ag Education, 1965

On the faculty of York High School in York, S. C., there is a man who has dedicated his life's work to giving vocational agriculture the position of importance it deserves.

Mr. Floyd D. Johnson graduated from Clemson University in June of 1939 with a B.S. degree in Agricultural Education.

While at Clemson Mr. Johnson was very active in student church work and was elected President of the Baptist Student Union his senior year. He was also very active in Alpha Tau Alpha, the national honorary, professional fraternity of Agricultural Education. Mr. Johnson was also actively interested in the collegiate chapter of the F.F.A. at Clemson.

Immediately upon graduation Mr. Johnson went to York and took over the Vo. Ag. department there. Once at York he felt his first obligation was to build a strong high school program and work from there. He began building this strong program by recruiting high school boys that were actively interested in vocational agriculture. He wanted boys who were interested in receiving training in production agriculture. He looked for boys that were willing to learn by doing; boys who could put this training into practice.

Mr. Johnson became interested in the F.F.A. and what it could offer his program. Once he had the material he needed, he began his program, largely through the F.F.A. Since he went to York twenty-six years ago, Mr. Johnson has kept his classroom instruction closely integrated with his F.F.A. chapter program. Today he has built one of the most active and productive chapters in the state. Wherever contests are held throughout the state, York has always been well represented, whether it be in livestock judging, dairy judging, public speaking, parliamentary procedure, or various other contests.

The York F.F.A. Chapter always sends delegates to the National F.F.A. Convention. There they participate and learn and bring their experiences back home to help build a better chapter.

During the past twenty-six years, more than fifty boys from York have earned the State Farmer degree under the leadership and direction of Mr. Johnson. One of these boys has gone on to win the Star State Farmer degree and three of his students have earned the most coveted American Farmer degree.

Using this strong high school program as a nucleus, Mr. Johnson began to broaden his program to include part-time farmers (now called young farmers) and adult farmers. He made available to the groups training that would help them to realize more returns from their farms. He helped young farmers to get started in a sound production program, and older, more experienced farmers, to employ production practices that would increase their farm's earning power. Today he has twenty-six members actively engaged in his young farmer program and fifty-one members in his adult farmer program.

Mr. Johnson has cooperated with Clemson University in its off-campus teaching program since the program was originated. In all he has helped to train some twenty-three young educators to take their place in departments throughout the state as well as places in other agricultural related jobs. Many students have chosen Vo. Ag. as their profession as a result of the influence they received from Mr. Johnson during their teacher-training period at York.

In his work at York, Mr. Johnson saw where membership in certain organizations could benefit him in his program. He joined the South Carolina Vo. Ag. Teachers Association where he soon became District Vice-President. From there he went on to be elected Vice-President of the S. C. Vo. Ag. Teachers Association in 1953 and served in that capacity during 1953 and 1954. As a result of his work in this office, he was elected President of the organization in 1954 and served that office well during 1954 and 1955. In 1956 he was elected alternate Vice-President of the Southern Region National Vo. Ag. Teachers Associa-

(Continued on Page 14)

THERE IS A FUTURE

IN

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A NEW DEVELOPMENT

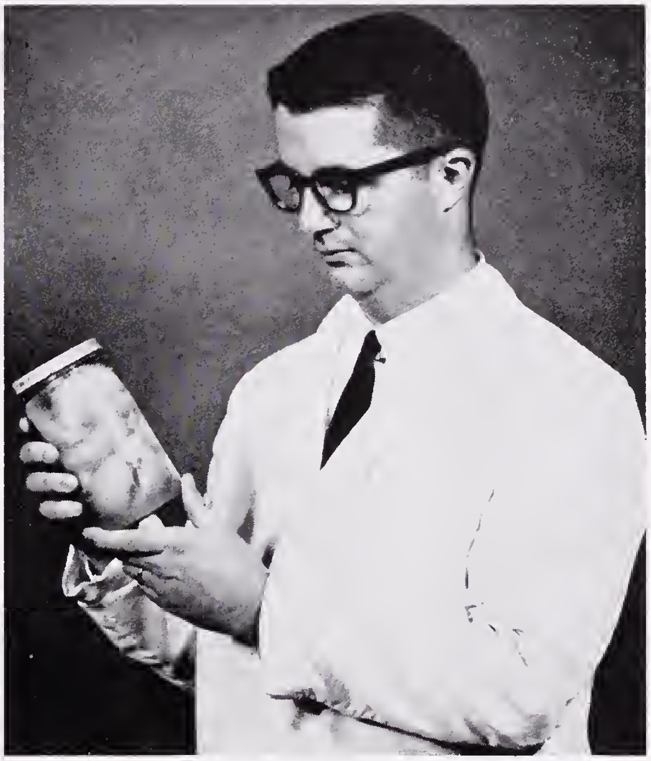
Al Keller
Graduate Research Assistant in Horticulture

In today's fast moving world the trend is toward more prepared foods for home consumption. Working toward this end, the Department of Horticulture at Clemson has been working for the past three years on a method for processing fresh prepared peaches.

The project was a grant-in-aid sponsored by Troy H. Cribb and Sons of Spartanburg, South Carolina. During this past summer I had the opportunity of working on this project and sampling the end-product.

During the past three years about 2000 bushels of peaches have been processed in the Horticultural Products Research Laboratory. The peaches come to the laboratory while slightly firm and are held until soft ripe by storing in a warm room.

The actual process involves conveying the peach through a boiling lye (NaOH) bath, thorough washing, and cutting the peaches in quarters with an experimental pitter. This machine is a high speed pitter developed by L. O. Van Blaricom of the Horticultural staff at Clemson. Next the peaches run along a belt from which they are trimmed of defects and placed in jars. The peaches are then covered with a light syrup of sugar and water, plus small amounts of sodium bisulfite, sodium benzoate, citric acid, and ascorbic acid. These chemicals are added to inhibit the growth of spoilage organisms, prevent browning and discoloration, and retard enzymatic activity.



The jars are then sealed and conveyed through a hydro-cooler where ice cold water is pumped over them. They enter the hydro-cooler at a temperature of about 90°F. and after 15 minutes are cooled to 50°F. The jars are then placed in cartoons and held in storage at 28 to 30°F.

Storage life is a critical part of the research project and studies are now underway to deter-

(Continued on Page 10)

Who was the smartest inventor? Edison. He invented the phonograph so people would stay up at night and use his electric lights.

"What's the matter?" asked the girl.
"We're out of gas," replied the boy. "We may be here quite a while."
The girl smiled shyly as she took a bottle from her bag and said softly, "We can make good use of this, then."
"Great," said the boy with a pleased grin. "Is it gin or whiskey?"
"Neither," she smiled. "It's Ethyl. I've been out with you Clemson men before."

A hangover isn't serious until you can't stand the roar of a Bromo Seltzer.

And there was the judge who told the condemned man ,"You'll just die when you hear this one!"

Driver of car: "I take the next turn, don't I?"
Muffled voice from back seat: "Like hell you do."

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FORESTRY vs LUMBERING

John B. Hatcher, Jr., Forestry, 1965

Forestry as defined by the Society of American Foresters is the scientific management of forest land for the continuous production of goods and services. On the other hand, lumbering may be defined as the utilization of trees with little or no regard for their replacement. On any piece of property, no matter how large or how small, the decisions for the methods of operation are entirely up to the owner. By electing to practice good forestry the landowner can increase his income on an average annual basis, and at the same time raise the value of his property.

In South Carolina there are approximately 12 million acres under trees, and nearly half of this is in farm woodlands. As one can readily see, six million acres even though divided into small parcels could produce a very sizable amount of timber. On the average farm in South Carolina the woodlot consists of 43 acres.

It has been established that on large forest holdings the intensity of forestry practiced is much higher than that on small holdings. This can be seen easily when one considers the economics of the situation. On most small farms timber production is not the major source of income, therefore forestry necessarily takes a back seat to farming. In many cases the small landowner holds down a regular job in addition to managing a farm. However, with a little effort the farm woodlot could be turned into a more profitable venture.

The major reason for the lack of forestry practiced on small holdings is the deficiency of capital. If a farmer has a bad season or for some other equally good reason he runs short of cash for operating the farm, he usually resorts to cutting some of his timber. It really makes no difference to him what stage of growth his trees are in. He needs money, and he can get it from his woodlot. Once the small landowner finds himself in this predicament he is in no position to consider market fluctuations; he has to sell his timber.

In South Carolina the Commission of Forestry employs many foresters who do little else besides help and advise landowners. This costs the landowner nothing, but by using sound forestry practice as outlined by a competent forester, one may increase his gains substantially. It should never be thought that these changes can occur overnight or even in two or three years. However, over a period of probably ten to thirty years a man who uses sound forestry principles will not only be ahead from the financial standpoint, he will also have new growing stock which is ready to yield financial benefits.

The best way to set up a revolving annual cut is to make an effort to place the woodlot on some type of sustained yield. For a farmer this would mean the continuous production of timber with the annual income more or less equal. It would also mean that there would be some sort of balance between growth and harvest. It is implied by this that the owner of the woodlot would have to regenerate the area harvested each year. Over the long run there would be a small area ready to cut every year. Since the average farm woodlot in South Carolina consists of 43 acres, it could very easily mean that the farmer would cut only one acre per year. To most small landowners who have no background in forestry, this would probably seem like an insignificant area to cut each year. However, most people feel that a steady annual income is much better than large payments at irregular intervals.

Nearly everyone, at some point in life, looks for an investment that will provide, with relatively low risk, a means of security for old age, a provision for the education of his children, or a nice inheritance for his heirs. An investment in forestry can provide all of these, and it will provide all—not just one. Lumbering will not do this! A small landowner has this option, and it seems senseless to discard all of the advantages that forestry can provide over lumbering when they could be realized so easily.

A poorly managed stand with only seed trees and much hardwood competition.

A well managed stand of southern yellow pine that could provide for you and your children.

A MILK PRICE WAR

Jim Busby, Dy. Sc., 1966

Milk selling for 39c per half gallon in South Carolina! How can it be sold at this low price? Well, it is being done although economically it is not a sound practice. There is a price war on milk similar to gas price wars that have occurred in other areas.

Let's get a few facts together and present the case of the dairyman in this dilemma of declining prices.

The dairyman, or producer as he is better known, is engaged in a highly regulated industry which imposes very rigid sanitary restrictions on the production and processing of milk. Milk is a highly perishable product. It is not only an excellent food for man but also for almost all forms of life including bacteria. Because of the nature of the product extra sanitary precautions must be practiced. These sanitary regulations are enforced by the Public Health Department in order to safeguard the health of the consumer. These regulations include the testing of cows to determine if they are free of diseases, the types and kinds of milking barns, procedures and equipment. In essence, these are requirements imposed upon the producer by the consumer. These requirements cost money.

In order to assist the State Health Department in regulating the dairy industry, South Carolina enacted laws in 1953 to provide for the orderly disposition of Grade A milk produced in the state and to require all milk entering the state from other areas to be of the same quality as milk produced locally. The Dairy Commission was created as the agency under this law to supervise and regulate the entire fluid milk industry of the state.

Now back to the price war. Several years ago a large independent supermarket in Greenville began selling milk at 37c per half gallon. This milk was sold as a "loss-leader" to entice more customers into the store to increase sales of other articles. Because this low price milk was affecting milk sales in other areas of Greenville, the Dairy Commission was asked to study this practice. The Dairy Commission held a public hearing as required by law before any action could be taken and asked interested parties to participate. As a result of the hearing the Dairy Commission ruled on November 5, 1959 that the action was illegal and enjoined the supermarket to raise its retail price for milk. The supermarket protested this ruling and obtained a temporary injunction restraining the powers of the Dairy Commission. The case was taken to the South Carolina Supreme Court in 1960 which ruled by a 3 to 2 decision that it was unconstitutional to regulate retail milk prices.

As a result of this ruling by the Supreme Court, a new law for regulating the dairy industry was enacted in 1961. The basic difference between the two laws was that in the first the Commission had the authority to set the price at all three levels—producer, processor-distributor and retailer. The second law specifically said that the Commission had authority to prevent sales below cost, but only when the dairy producer was in danger of economic destruction. Since the producer was being paid full price for his milk, the supermarket continued to sell milk as a loss-leader.

The real milk price war started on April 4, 1963 and was triggered by the purchase of Paradise Ice Cream Company by Piggly Wiggly Wholesale, Incorporated of Charleston. It was Piggly Wiggly's intention to process milk and offer it for sale in one half gallon containers for 39c in their stores. They contended that this figure was above their cost and that milk would be sold at this price and not as a loss-leader. They also contended that milk sold to the consumer at this price would not lower the price to the producer supplying milk to Paradise.

The usual wholesale prices for a one-half gallon of milk was 48-49c. The retail price was 53c. Because milk comprises a large part of the food dollar for young growing families, especially, and the young growing family spends more of its income on food, any money saved on milk purchases by the consumer can be spent for other items which are more profitable for the supermarket. This is why milk makes such a good loss-leader to get more customers into a store.

Paradise milk being sold in more stores covering a relatively large area of South Carolina, as compared to the independent store in Greenville, caused milk processors in these areas great concern. Rather than lose their sales in supermarkets the processors and distributors met Piggly Wiggly's price by reducing the wholesale milk price to their outlets. A loss of sales by processors would reduce the need for milk from the producer. Since the processor could not take the full ten cent loss per half gallon, producer prices were lowered to permit the loss to be shared by plant and producer. This reduction to the dairy farmer ranged from 73c to $1.13 per one hundred pounds of milk (milk is purchased on one hun-

(Continued on Page 13)

The Milk-Machine Alliance

Douglas McCrary, Agricultural Economics, '65

A vast new trend has come upon the American retailing scene. The vending machine has become a dynamic force in the field of marketing. Everything from soft drinks to stockings and toothpaste can be purchased from a vending machine. Food is the largest single item being sold by vending machines today. Together the sale of soft drinks and coffee totaled more than $700 million dollars in 1962. Most industries now have entire batteries of food vending machines which dispense food to the employees. Some schools are now experimenting with this idea. Of course, almost everyplace a group gathers, there is a vending machine selling some item of food or cigarettes.

The milk-vending industry has been growing by leaps and bounds along with the rest of the vending industry. A few statistics show the scope of milk vending operations. There were 47,300 indoor milk venders in use on January 1, 1960, according to the census of industry for that year. Each machine sold an average of 250 units of milk per week. Most of these sales can be counted as additional sales. That is, many people drink milk from vending machines as a refresher or pick-up drink. Clearly today, when both the dairyman and processor are in a profit squeeze, all ways of expanding the market should be welcomed and explored.

Once a milk-vending machine operation has been decided upon, the plan of operation should be studied very carefully, or else it could prove a most painful and expensive venture. The requirements for success are many. Of course, the first factor to consider is whether to sell small units of milk, one-half pints, one-third quarts and pints, or large units of quarts and one-half gallons. Either of the two units of size would require different locations as they would be appealing to different segments of the market. For instance, the number of potential locations for small unit vending machines is much greater than machines dispensing larger units. Schools, military posts, swimming pools, parks, factories and numerous other places are potential locations. For instance, one might place a machine in a school from September to May, then move it to a swimming pool for the summer months. With this type of marketing, however, competition is great from coffee and soft drinks. This is especially true in industrial plants and recreation areas. In the installation of a vending machine, an administrator or manager should stress the time saved, convenience to students or employees, and the cleanliness of the operation.

Treating the vending operation as a step child is a mistake that many milk distributors make in regard to vending operations. Successful vending requires know-how, a substantial investment, systematic and careful management, and trained personnel. Know-how is the ability to oversee the general vending operation. A general knowledge of marketing and maintenance is required. The indoor machines cost between $800 and $1,000 while the larger outdoor types cost between $3,000 and $4,000. Systematic careful management is required, if the operation is to be profitable. Population changes, buying habits and patterns must be studied so that the machine can have maximum volume, while minimizing expenses. Perhaps the biggest requirement for profitable operation is well trained personnel. A good route man should be able to notice selling patterns and report them to the management. The machine should be kept clean and attractive. Routemen should be able to make minor adjustments and quick loading in the machines If a route man can save a service call, then the operation will be dollars ahead.

DAIRY CLUB NEWS

Andy Moss

The Clemson Chapter of the American Dairy Science Association began its activities for the new year with a supper at the home of Dr. and Mrs. J. T. Lazar. Dr. Lazar is the club's faculty advisor. This get-together served as a welcoming for new members and as an organizational meeting for the club.

The club's first regular meeting was held on the evening of October the thirteenth in the Student Center. This meeting was highlighted by reports given by the members of the Dairy Cattle Judging Team and the Dairy Products Judging Team. These teams judged in both the regional and national contests.

The dairy cattle judging team, composed of Shuler Houck, Spann Brabham, and Jimmy Williams competed first at Memphis, Tennessee, in the Southern Regional contest and then moved on to Waterloo, Iowa, for the national contest at the National Cattle Congress. Although the Clemson team failed to place among the top teams, they gained much valuable experience and saw many interesting dairy operations and other places of interest during the course of the trip.

The dairy products team competed in the Southern Regional Contest at Louisville, Kentucky and then at the National Contest in Chicago. Out of eight teams competing at Louisville, the Clemson team, made up of Terry Blakely, Nicky Baskin, and Jimmy McMillan, placed third in cottage cheese and fifth in ice cream. The team also placed fifth in all products. In the individual scoring, Nicky Baskin finished fourth in cottage cheese and sixth in butter. Terry Blakely was fifth in cottage cheese and sixth in ice cream. At the national contest in Chicago the team placed ninth in ice cream out of twenty teams competing.

Jimmy Williams, President of the Clemson Chapter of ADSA, and also President of the National Student Branch, spent several days during

(Continued on Page 17)

NEW LIVING QUARTERS FOR CHICKENS?

Nelson McLoughlin, Poultry Science Dept. (1965)

The type of poultry housing for broilers and layers in the Southeast may be in for a drastic change. The predominant house design is now mainly pole construction with merely a roof. This seems to be giving way to the completely controlled environment house.

What has caused this change to come about? In actuality, the completely controlled environment house has been in use for many years, particularly in the northern and colder regions of the country. The much colder areas of the country have been almost compelled to construct a poultry house in which the environment is completely controlled due to the severe extremes in weather. Competition between the northern and southern regions of the country has been very keen in production of eggs and poultry meat. The northern regions have the so-called disadvantage of higher housing cost as compared to the low cost housing of the South. But has this really been such a disadvantage to the North? Records of production in these controlled environment houses of the North point towards economical benefits of the producer in the forms of better feed conversion, better production, a better profit, and more birds to the house. Will these better production factors actually pay the producer to construct the outlandishly expensive controlled environment house in the South? Will the environment of the house combine with the genetically proven quality bird and pay the producer the extra cost of improved housing? Many authorities say "yes" and many think otherwise.

Since this is such a vital question among poultrymen in the Southeast, Clemson University has responded to the cries of the producer and is planning research in this field in the very near future. State appropriated funds of $100,000 will be used in the research for construction of various types of housing. Data will be collected as to which construction type is best suited to the South Carolina producer. Furniture arrangement within the houses, density of birds, amounts of insulation needed, and all general economic aspects will be studied.

Among the houses to be constructed will be three very distinct types. The first is a windowless, forced ventilated house having both walls and ceiling heavily insulated. A second type is the pole type house having merely a roof, natural ventilation, no insuulation, and polyethylene used as a side wall in winter. The third type will be a compromise between the other two. It will have an insulated ceiling, plastic cloth for sides with partial walls. Each of these houses will accommodate around 3300 layers.

Research information in this field will prove very interesting and important to the poultry industry of the South. No longer is poultry housing a mere shelter and confinement area for birds, but is in fact a technical piece of equipment which the skilled and efficient producer must use as a tool to better production.

ASAE NEWS

By Charles D. Ables, Ag E, '65

The South Carolina Student Branch of the American Society of Agricultural Engineers held its first regular meeting of the 1964-65 school year on September 22, in the Ag Engineering Auditorium. The main purpose of this meeting was for organization and committee appointments for the coming year. Several amendments to the constitution were presented which included changing the wording from Clemson Agricultural College to Clemson University.

The second regular meeting was held on October 13, in the Ag Engineering Building. The new members were invited to this meeting and were instructed on the initiation procedure. The main part of the program consisted of slides shown by Dr. Lambert of his, Mr. Wilson's, and Gene Rochester's trip to the National Summer Meeting of ASAE, held this past summer at Colorado State University. At this meeting our branch president, Gene Rochester, was elected Second Vice-President of the National Council of ASAE.

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SUCCESS AND SERVICE

A Profile of Dr. William H. Wiley

Kenneth K. McDaniel, Feature Staff

Dr. W. H. Wiley is not a native South Carolinian. He was born February 19, 1913, in Wildhurst, Texas, and graduated from Port Arthur High School, Port Arthur, Texas in 1931. He is a graduate of John Tarleton Agricultural College and the A & M College of Texas. He received his B.S. degree, 1936, majoring in Poultry Husbandry. Dr. Wiley earned 100% of his college expenses by working on the College Poultry Farm of each institution. He entered the Texas A & M graduate school in 1936, and working as a graduate assistant, received his M.S. degree in 1937. After a year of instructing at the University of Arkansas, he re-entered Texas A & M to pursue more graduate work. In 1949 Dr. Wiley received his Doctor of Philosophy degree in Genetics and Zoology.

Dr. Wiley served in the United States Army from 1942 until 1945. He now holds the rank of Colonel in the Army Reserve.

In 1947, he was elected Head of the Poultry Department, at Rhode Island State College. Later in 1959 he assumed the position of Dean of the College of Agriculture, University of Rhode Island. He held this position until July 1, 1962, when he became Dean of the College of Agriculture and Biological Sciences at Clemson University.

Dean Wiley is married to the former Miss Anne Earle and is the father of a 16 year old son, Douglas. He is a member of the American Genetics Association, Poultry Science Association, American Association of University Professors, Alpha Zeta, Phi Kappa Phi, Sigma Xi, Phi Sigma, and Gamma Sigma Delta honorary and professional fraternities. He is also a member of the Lions Club. Tavern Hall Club, Grange, Kingston Improvement Association, and Fellowship Club of Clemson.

The accomplishments Dr. Wiley has achieved in his career are as outstanding as his contribution to the field of Agriculture. It is with much pride that **The Agrarian** presents the **Success and Service** of Dr. William Henry Wiley, Dean of the College of Agriculture and Biological Sciences at Clemson University.

Alpha Tau Alpha News

Alpha Tau Alpha, the National Honorary, Professional Fraternity for Agricultural Education students, held its monthly meeting on October 20, 1964. The purpose of this meeting was to consider candidates for admission to the fraternity. The following students were extended an invitation due to their scholastic achievement, character, and leadership abilities: Gordon Chipukites, Wayne Coward, Furman Lollis, Jon Poteat, and Quincy Smith.

New officers presiding this year are: President, Bill Whitfield; Vice-President, Bill Plaxco; Secretary-Treasurer, Al Berry; Sergeant at Arms, Hugh Caldwell.

On October 13-15, 1964, The National Alpha Tau Alpha Conclave was held in Kansas City, Missouri. Hugh Caldwell represented the Kappa Chapter of Clemson University at this conclave.

A NEW

(Continued from Page 5)

mine the maximum safe storage time. They have been consumed through a period of 14 weeks after harvest with retention of relatively good fresh color and flavor.

The peaches have been marketed in New York City; Jacksonville, Florida; and Spartanburg, South Carolina. They have also been served over a seven weeks period in 1963 in the Clemson University dining hall. The Department of Agricultural Economics is conducting studies on the marketing of the fresh prepared peaches. Preliminary reports show very good acceptance of the product by the consumer.

With this new product the consumer will be able to have fresh peaches in seconds without the inconvenience of peeling, pitting or cutting.

South Carolina Hunting Prospects

F. Spann Brabham, Dy. Sc., 1965

Prospects are excellent for another banner hunting season in South Carolina in the fall and winter of 1964-65. Open seasons will be declared on two species of big game and eight species of small game.

The entire state has received an excessive amount of rainfall this year, and much of this has come during the breeding season of our game animals and bird In spite of this, indications are that we have a plush new crop. Many of South Carolina's game wardens were surprised to see this abundance of offspring, especially in the low country where water pushed most of the game to higher ground.

The two species of big game being hunted in the state this year are whitetail deer and black bear. The hunting prospect for the whitetails ranges from excellent to good, depending mostly on location. The Coastal and southeast section is considered best, while the Piedmont Management Area is considered good. It is expected that a two week season will be set in each of the management areas. The deer season in most of the state opens on August 15 and ends on January 1. This year, some form of doe shooting is expected in many of the over-populated areas. The extreme northeastern section of the state, consisting of Greenville, Pickens, and Oconee counties, expects fair black bear hunting between November 15 and December 1.

The entire Southeast has enjoyed excellent quail hunting for the past several years. Some states are forecasting a slight decline in population for the fall of 1964, but South Carolina is predicting excellent to good prospects. The Coastal area is best, but central and western areas are expected to have good quail hunting. One of the greatest complaints of the quail hunters is that there isn't enough opportunity for public shooting in the state. Landowners usually have their property posted, guided hunts are too expensive, and there is very little state-owned quail territory. Therefore, it is necessary to either own land, rent hunting rights, or have a good friend that has access to hunting territory.

Gray squirrels and fox squirrels have shown some decline in most areas this year, but prospects are good for the mountains and coastal river swamps. Squirrel season opened October 15 and ends March 1.

Ruffed grouse is a relatively new game bird for South Carolinians and a great deal of effort is being extended by our game department to establish a sizeable population of these birds. There have been plans to inaugurate a season on grouse in Greenville, Pickens, and Oconee counties, but these plans are incomplete and it may be next season before any grouse shooting occurs.

Cottontail rabbits are considered a pest in the coastal counties due to the extremely heavy populations. Rabbit hunting for this year will range from excellent to good, and considerable hunting is needed to reduce populations. Beagle hunters should have another exciting season.

Wild turkey populations have been constantly on the rise, especially in the Coastal forests and Piedmont Management Area. There is good pubic opportunity for turkey shooting, since most of the turkeys are found in management areas and extremely large, unposted forests. Last year, there was a split season on turkeys: from November 25 to January 1, and from March 1 to April 1. This year, there may be a single season in some counties, starting November 25 and ending March 1.

The season opened on September 1 for raccoons and opossums, and ends March 1. "Coon" hunting will be excellent to good in the Coastal areas and good to fair in the Piedmont. Opossums are abundant throughout the state.

No mention was made of the seasons on our migratory game birds since they vary from year to year. But, populations in the nesting areas indicate that there will be good seasons on both doves and duck. Duck hunting will be best on the extreme coast, but will be good to fair throughout the state.

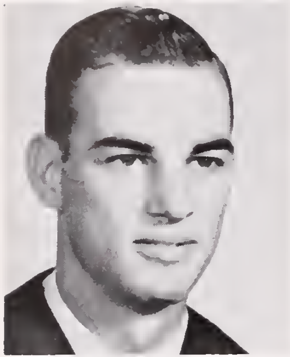
Doves, being hunted in a split season fashion, are plentiful this year, as was indicated by estimates of kills during the first season which ended in October.

According to The Olin Mathieson Conservation Department, game populations, in general, are increasing in areas of game management. That we need more game management by individuals cannot be too highly stressed. Proper management of game not only provides better hunting, but also preserves one of our greatest outdoor sports.

AYF LEADERSHIP CAMP

Carl E. Brown, Jr., Ag Engineering, 1967

This past summer I attended the American Youth Foundation's leadership training camp on Danforth Scholarship. The camp provides training to selected young people. The camp lasts for two weeks. Each day of this two weeks is planned to the minute so that each person will get the most out of his stay. There were several courses taught. The American Youth Foundation believes that these courses can provide the basis for good leadership in America. These courses included Leadership Training, The Life and Teachings of Jesus, America—Its Ideals and Traditions, and Balanced Fourfold Development. This last topic emphasized the balanced fourfold development of the religious, mental, physical, and social aspects of one's character. In short, it emphasized the development of the whole man. The camp's motto, "My Own Self, at My Very Best, All the Time" is stressed in all of its programs.



The camp provided opportunities for the leadership qualities of the individual to develop and to be used. Various games gave the person a chance to function both as an individual and as a member of a team. There were also opportunities to lead in social functions and to lead one's particular class by running for class offices.

The camp offers one a chance to be with boys from all over the United States, Canada, and several other countries. This past year there were boys from Hawaii, Ghana, Turkey, and Malaya. Many lasting friendships have come out of those two weeks at Camp Minawanca.

The camp is located on the beautiful shores of Lake Michigan. The name of the camp, Minawanca, means many waters. As the name implies, there are many waters at Camp Minawanca. The Camp is bounded to the west by Lake Michigan, to the north by two small creeks, and to the east by a large lake called Stoney Lake. The Camp is located in the small resort town of Stoney Lake, Michigan. Stoney Lake is about 40 miles north of Muskegon.

(Continued on Page 17)

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A MILK

(Continued from Page 7)

dred pound lots). This reduction cost producers $7,000 daily and would amount to $2.5 million annually. Processors suffered a similar loss.

If these losses continued many dairymen in South Carolina would be forced out of business; in fact, many of them have. The Dairy Commission, because of the danger of economic destruction resulting from chaotic marketing conditions, called a hearing on April 25. Two thirds of the dairy men in South Carolina were in attendance. Evidence obtained by the Dairy Extension Division of Clemson University and others was presented proving that producers were in danger of economic destruction due to the milk price war.

As a result of the hearing the Dairy Commission used its authority on April 29 and regulated the price of milk at all levels. An independent supermarket in Greenville objected to this price fixing. This store had been selling milk for 37c per half gallon strictly as a loss-leader for years. It obtained a court injunction against the Dairy Commission prohibiting the Commission from enforcing its order. Piggly Wiggly stores also obtained injunctions permitting them to sell milk at 39c per half gallon. To meet this competition dairy plants themselves obtained injunctions to meet any prices set by competitors. The difference in costs between the regular price and the lower price for milk has been shared equally by the producer and distributor.

Because of the chaotic conditions that resulted in the marketing of milk, Governor Donald Russell, after consulting with leaders of the industry, appealed to the industry on July 6 to raise prices back to normal. Most of the business concerns increased the price of milk back to its normal level due to this appeal.

The Dairy Commission continued to study marketing conditions and made a further auditing of Paradise Ice Cream Company. As a result of its findings, on January 29, 1964 it set a retail price of 51c and a wholesale price of 46.664c. These prices were contested in court on March 30 by Paradise resulting in Paradise being permitted to sell milk at a retail price of 45c. By the latter part of April many stores in Greenville were selling milk at 89c per gallon. Dairy plants during this time were absorbing all the loss. However, on June 25 the producer price of milk dropped in eight counties and this was followed later by most other counties.

Chaotic milk marketing conditions existed in the state. The Dairy Commission, in order to erase the injunctions and to determine its authority, asked the Supreme Court for a ruling on the constitutionality of the state's dairy laws. The Court ruled in a 3 to 2 decision that it was unconstitutional for the Dairy Commission to set milk prices at the retail level. As a result of this ruling the milk price war continues.

The milk price war has caused a reduction in the number of producers of Grade A milk in South Carolina. During the year April 1, 1963 to April 1, 1964, 72 producers have discontinued their dairy operations. This makes a total of 86 producers during a 16 month period. In the past the dairy industry has been one of the more stable industries in the state. The production and sale of milk by South Carolina producers and processors fed many dollars into the local economy. However, if the South Carolina dairyman cannot be paid a fair return on his investment, he will be unable to remain in business. These dollars will flow out of the state. Also the consumer in South Carolina may not be assured of the same quality of Grade A milk supply in the future.

The Dairy Industry is making detailed studies to determine what steps should be taken to safeguard the public health and to increase marketing efficiencies. Until then the milk price war continues.

Block And Bridle News

Danny Bozard

The Clemson University Block and Bridle Club year is underway, with the initiation of new members highlighting the first part of the Fall Semester. The new members began their initiation procedures on the 8th of October and were formally initiated into the club on the 13th, following a club cook-out at the Food Industries Building.

The Senior Livestock Judging team has also been active, participating in a state-wide judging workout the second week of September and taking part in the Mid-South Livestock Judging Contest in Memphis, Tenn. and the Southeastern Judging Contest in Atlanta, Ga. on the 26th of September and 10th of October, respectively. Members of this team are: Bob Bishop, Billy Bookhart, Danny Bozard, George Dorn, and Jack Ruff. The team is now in preparation for the International Livestock Judging contest which will be held in Chicago, Ill. during Thanksgiving.

4-H CLUB NEWS

The Clemson University 4-H Club was organized in May of 1952 by those students who had previously been active in 4-H Club work and felt a need to establish an organization which would maintain their service and social contacts with 4-H alumni and the active 4-H program.

The objectives of the club are to establish closer friendships among students and college officials, and to train its members for leadership. The functions of the Club are coordination of the recreation during Farm and Home Week, cooperating with the Clemson Agricultural Council in its projects, and taking an active part in campus activities.

Some of the activities of the club include the monthly meetings of general interest to college students. These meetings consist of discussions and talks on various current affairs and the application of modern agricultural techniques in today's world. The monthly meetings are held the 4th Thursday of each month at 7:30 p.m. in meeting room No. 4.

The club extends a cordial invitation to anyone interested in joining, or visiting our meetings.

SUCCESS IS

(Continued from Page 4)

tion. He served for one year in that capacity and used his ever growing influence well in making the needs of the South felt. In 1957 he was elected Vice President of the National Vo. Ag. Teachers Association and represented the Southern region in that capacity during 1957, 1958, and 1959.

On December 4, 1959, at the national convention meeting in Los Angeles, California, Mr. Johnson was elected President of the National Vo. Ag. Teachers Association. He served well in that position for one year. During his term as president he served on various committees and worked on a number of programs to establish many new concepts and ideas in the field of Vo. Ag. education. As a result of this office he was appointed to the board of directors of the National Vo. Ag. Teachers Association.

In 1960 Mr. Johnson received his Masters degree from Clemson University. During all of this time Mr. Johnson never lost sight of the fact that he was first of all an agriculture teacher. His classroom never suffered from the time spent on his other duties and obligations. The York Chapter continued to grow in importance and prominence. Mr. Johnson's influence began to be felt in higher places.

On October 5, 1961, President Kennedy appointed Mr. Johnson to the Panel of Consultants for Vocational Education. He served on the panel until their work was completed on November 27, 1962. The report that came as a result of this panel's observation and work was the basis and used primarily for recommendation of the Vocational Education Act of 1963. As far as agriculture is concerned this new law broadens the base of the instruction program, permitting more flexibility. It held on to the basic concepts of past years, but made possible training in agricultural occupations that require a knowledge and a skill of agriculture.

The following is a portion of the new law:

> ". . . any amounts allotted (or apportioned) under such titles, Act, or Acts for agriculture may be used for vocational education in any occupation involving knowledge and skills in agriculture subjects, whether or not such occupation involves work of the farm or the farm home, and such education may be provided without directed or supervised practice on a farm . . ."

Mr. Johnson was instrumental in getting this concept into the new law. In the past, legislative limitations have limited training to farming only as production agriculture. This new law will open the door to training for employment in fields of agriculture in a broader sense. This new law not only provides for training to engage in production agriculture, but will allow classroom training for agriculture occupations other than production agriculture. It will help to develop an appreciation for career opportunities in agriculture as well as develop the ability needed to secure these jobs. It will help develop abilities needed to be a success in agricultural occupations and to filling occupational, social, and civic responsibilities.

In December of 1963, Mr. Johnson was elected Vice-President of the American Vocational Association, representing the Agricultural Division. The Agricultural Division includes some ten thousand members. This office makes him a member of the Board of Directors of the American Vocational Association. This new position will afford him another chance to have his voice heard and his influence felt.

In a short forty-eight years since his birth, Mr. Johnson has become an outstanding member of his profession, not only in South Carolina but throughout the nation. This new law opens the door for a new era of agricultural training. Mr. Johnson stands in this doorway, ready to do his part in keeping agriculture dynamic.

Pre-Vet Club News

The Pre-Veterinary Club is organized for the purpose of bringing Pre-Vet students closer together and to give them a chance to increase their knowledge of veterinary medicine.

The club meets twice a month. An interesting movie is presented at the first meeting of the month and a speaker appears at the second meeting.

The club takes two trips during the year. An interesting trip is made to the Columbia Experiment Station and an interesting and informative trip is taken to the University of Georgia School of Veterinary Medicine.

The membership is open to anyone who is interested in Veterinary Medicine.

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ALPHA ZETA NEWS

The South Carolina Chapter of Alpha Zeta is meeting this year in the Student Center rather than in the Plant and Animal Science Building. It was the feeling of the membership that attendance could be improved by having the meetings nearer the dormitories.

The result of a poll taken of all professors who received teacher evaluation reports indicated that 70% of the professors reporting favored the continuation of this project by Alpha Zeta. As has been done in the past this project will again be carried out during the last few weeks of each semester.

Alpha Zeta is attempting this year to compile a list of all Alpha Zeta alumni of Clemson University. An attempt will be made to contact all alumni and get a reply from each one. If this project is successful we hope to print a booklet containing the names and present addresses and position of all AZ alumni. This booklet will be distributed to all those interested.

Another project Alpha Zeta hopes to coordinate this year is a book sale. Anyone interested in selling or buying textbooks will be invited to consign them to Alpha Zeta for sale. The prices will be set by the owner of the book and AZ will receive a small commission to pay overhead and operating costs. It is hoped that through this project, students will be able to save several dollars each year on textbooks.

Early in the spring Alpha Zeta is planning to sponsor a picnic for all agricultural freshmen. The purpose of this picnic will be to acquaint the freshmen with Alpha Zeta, its aims and purposes. It is felt that a greater respect for membership in AZ can be obtained.

AN IMPERFECTION

The staff of The AGRARIAN realizes that this magazine is not perfect. We know that you can write better articles and that you can tell funnier jokes. We know that you could have gotten the magazine out sooner and for less expense.

Please send us your suggestions. We will be happy to use them. Or better yet, bring your suggestions to us and work with us on the staff. Our staff is open to any student interested in Agriculture whether he is an Ag major or not.

Please send all comments and suggestions to Jimmy Williams, Box 2853, University Station.

UNDERGROUND

(Continued from Page 2)

ism. This type of antagonist could be important to the farmer who grows leguminous plants such as alfalfa, which depend at least partially on nitrogen-fixing bacteria to "fix" nitrogen from the atmosphere. It has been suggested that poor yields of alfalfa in fields where alfalfa has been grown continuously for several years may be due to a buildiup of a bacteriophage population, resulting in the destruction of the plant-**Rhizobium** symbiotic association.

The "phage" attacks a bacterium cell by attaching its "tail" to the cell and enzymatically perforating the bacterium cell wall. The DNA in the "head" of the phage is then injected through the tail into the cytoplasm of the bacterium. Here the DNA of the phage will catalyze the formation of more phage nucleic acid and phage protein. After a brief period of "incubation" the cell splits and many new phage particles are expelled through this opening.

The typical phage particle is between 50 and 100 mu in cross-section of the polyhedral head. It seems amazing that such a small unit can cause so much trouble.

To all of us microscopic antagonism is an important war. We can only assume that before man was able to control microbial populations through crop rotation, chemical application, etc., there were only three limiting factors to a microbe's growth. They were (1) climatic and environmental factors, (2) nutrient limitations, and (3) antagonism among the microbes.

An understanding of this virtually invisible, underground war will often permit man to provide "military aid" to the "good guys" by providing a more favorable soil environment for their activities. This method of controlling undesirable micro-organisms has only been used to a very limited extent but offers great hope in the future for the control of certain plant diseases which are now classed as difficult to control.

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VOCATIONAL AGRICULTURE TEACHES OUT-OF-SCHOOL PEOPLE

Hugh Caldwell, Agricultural Education, 1965

For many years vocational agriculture has taught both in-school and out-of-school students the fundamentals of agriculture. At the present time more emphasis is being placed on offering additional instruction for the adult farmer group. Modern farming—larger operations, more mechanized, greater capital needs — presents many problems which farmers of the past did not have. The vocational agriculture out-of-school program is an attempt to aid farmers with these problems.

This year more people, young farmers and adult farmers, are expected to be enrolled in various courses offered by the local high school agriculture departments. These courses of instruction are planned to meet the needs of the individual. These programs are in addition to the regular adult classes held by the agriculture teachers.

There are two types of programs offered at present. The "Special" out-of-school courses are planned for 20 to 30 hours. Both types of courses will be taught by special teachers who are well qualified in these areas. This kind of instruction will be suitable for both full-time and part-time farmers.

The special courses will include farm welding, tractor maintenance, small gasoline engines, farm electricity, farm plumbing, farm carpentry, and painting. Instruction for these courses is provided mainly through laboratory work where persons can improve their skills in the various areas.

Post high school courses, longer, 200 to 300 hours, and more technical, are largely intended for young farmers and those who have most recently completed high school. These courses will include farm mechanics and ornamental horticulture taught by men specialized in these fields. The purpose of these courses is to up-grade persons already employed in these areas and prepare others for profitable employment.

Several post high school courses were conducted last year in South Carolina with favorable results.

These two types of course work, special and post high school, together with the regular classes for adults, should result in reaching more farm people with needed instruction.

COLLEGIATE FFA ACTIVITIES

Over fifty members and guests were present at the Food Industries Building September 29 for the annual FFA cook-out. Dean Wiley, School of Agriculture and Biological Sciences, and Dr. L. H. Davis, Head of the Agricultural Education Department made short and inspiring talks to the group.

The first regular meeting was held October 13. This meeting included routine business, setting up committees and viewing the film—"Wisconsin Agriculture Tour."

The chapter is planning a leadership training program for FFA officers in the nearby counties this fall.

Agricultural Economics Club News

The Agricultural Economics Club started the new school year with a picnic at the Y.M.C.A. cabin on September 29, 1964. This event was sponsored by the Agricultural Economics staff and was enjoyed by both staff and students.

The first Club meeting was held September 22, in Long Hall. New officers for the year were introduced along with the class advisors. The two advisors this year are Dr. H. C. Spurlock and Dr. E. M. Corley. The class officers are: Marshall Dantzler, President; Beverly Williams, Vice-President; Billy Gulledge, Secretary; Gene Dukes, Treasurer; Doug McCrary, Program Chairman; Jerry Milton, Publicity Chairman; and Gerald Dukes, News Bulletin Editor.

The Agricultural Economics Club has gotten off to a good start, and all members anticipate a successful year for the Club.

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The Editor Speaks

The Ralston Purina Company of St. Louis, Missouri, is doing a wonderful job in public relations with young people. Each year they give awards worth thousands of dollars to young men and women in the Land Grant Colleges of our Nation. They give both graduate and undergraduate scholarships as well as other awards.

Each spring one rising senior at Clemson is selected to be the recipient of one of these awards —The Danforth Award for Agricultural Seniors. A similar recipient is chosen at each of the other Land Grant Universities in the United States as well as in Canada and Puerto Rico. It was my good fortune to be chosen as the recipient of this award for 1964.

I knew very little about the award until I was notified to be in St. Louis, Missouri on the first Sunday in August. This was the beginning of the most wonderful 4 weeks I have ever spent. There were 44 "Danny Boys" in the 1964 group from 44 different states. For the next two weeks in St. Louis we were treated royally. Purina spared no expense in making us feel like real "big shots." We spent some time at the Purina Research Farm at Gray Summit, Missouri. We toured such places as McDonnell Aircraft Plant, Barnes Hospital Complex, Hunter Packing Company, Gardner Advertising Agency and many other interesting facilities.

After the two thrilling weeks in St. Louis our group moved to Stony Lake, Michigan for two weeks at the Youth Leadership Training Camp of the American Youth Foundation. These two weeks were spent in development of the four-fold character of the individual — spiritual, mental, physical and social. It was a most inspiring experience.

Ralston Purina paid all expenses for our four-week trip. These weeks were without question the most enjoyable and beneficial I have ever known. Our schedule was filled to the minute but we always knew that what was to come would be better than what we had already experienced so we were eager to go.

I wish to say thank you to the Ralston Purina Company, to our guide and chaperone Bob Morton, and to all the officials of Clemson who made my trip possible.

To each underclassmen in the College of Agriculture and Biological Sciences, I say, "Study hard and participate in extracurricular activities, this trip is well worth working for."

CAMP

(Continued from Page 12)

One of my fondest memories of Camp Minawanca is the "morning dip." At six every morning, everyone got out of bed for the flag raising, and exercises. Then those with stout heart and very likely weak mind would run into the icy waters of Lake Michigan. The water was usually about 50° and the surrounding air was sometimes that warm.

I attended this camp on a scholarship from the Danforth Foundation. The Danforth Foundation was founded by William Danforth, the founder of the Ralston Purina Company. The foundation pays the tuition for a freshman from each land grant college in the United States to attend a two week session of the camp in the latter part of August. The freshman must be enrolled in the school of agriculture. Applicant are judged mainly on academic record.

I thoroughly enjoyed my two-week stay at Camp Minawanca. I would encourage any freshman to apply for the Danforth Freshman Award.

DAIRY

(Continued from Page 8)

October in Chicago working with the national program planning committee in planning the 1965 meeting in Lexington, Kentucky.

On Tuesday night, October 27th, the formal initiation was held for the six new members of the Dairy Club in the auditorium of the Food Industry Building. The initiates were required to cater to the old members in various ways and they also put in a certain amount of time on building the club's homecoming display which appeared in front of the Chemistry building during homecoming.

The club's plans for the future include sending delegates to the Southern Regional convention in Dallas, Texas. Gene "Knot" Merritt is president of the Southern Section of ADSA.

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Biological Science Club News

Jim Griffin, Vice President

The Biological Science Club is proud to announce its official reopening. Undergraduates majoring in Biology felt that there was a great need for such a club. On Tuesday, October 27, 1964 a do-or-die meeting was held. The Club was a definite success. At this time officers were elected. James Dukes was elected President, Jim Griffin, Vice President, Linda Marganian, Secretary and Len Sloan, Treasurer.

We are looking forward to more freshmen joining this club, and anyone else who wants to join a club that is going places at Clemson University.

The purpose of this Club is stated best in the constitution: "The purpose of this club shall be: (1) to further the interest in the Biological Sciences by bringing together in an active group all students and graduate students majoring in these fields; (2) to acquaint the members with research and discoveries in the above fields; (3) and to foster and develop a spirit of fellowship among its members."

The club is also happy in having Dr. G. W. Anderson as its faculty advisor.

"Oh! dear, I've missed you so much"—then she raised the revolver and tried again.

"Is your girl spoiled?"
"No, it's just the perfume she's wearing."

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Student Agricultural Council News

At the last regular meeting of the 1963-64 school year, the Ag Council held its elections. Those elected were: Chairman, Jimmy Williams; Vice-Chairman, Danny Bozard; Secretary-Treasurer, Marshall Dantzler; and Reporter, Joe Shealy. Dr. Gene Stembridge was elected Senior advisor and Dr. T .H. Garner Junior advisor.

The Ag Council will meet the first Tuesday in each month at 4 p.m. in the Student Center.

As in the past, the Ag Council plans to promote Operation Contact. Through this program an attempt is made to contact high school students throughout the state and stress the field of Agriculture as an area of employment for them. This program has been a success in the past and we hope to make it even more successful this year.

Anyone who is interested in speaking to a group of students or in having someone else speak to a group may pick up literature and information from Dr. J. W. Jones in Long Hall.

The Ag Council is planning to coordinate a college-wide Agricultural Field Day in the spring. This idea is now being studied and any suggestions will be appreciated.

"Mother, are there any sky scrapers in heaven?"

"No, son, engineers build sky scrapers."

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PESTICIDE

(Continued from Page 3)

top soil is two million pounds per acre. On a percentage basis, the farmer is using a very low concentration of active chemical ingredient. Through the use of more specialized chemicals and such things as surfactants (surface tension depressants —similar in net effect to detergents), the active ingredient concentration per acre of pesticides has been greatly reduced over the past few years. Farmers are not indiscriminately contaminating our foodstuffs.

The soil, air, and water are the final depositories for all public, industrial, and agricultural wastes. Pesticide residue is only a phase of the very large problem of environmental pollution by wastes. The population explosion and urbanization movement have brought city and farm closer together. This has increased the problems of industrial waste and public waste disposal without contamination of farm land. When compared to the general pollution problem, pesticide residues do not rank a leading position in the scale of individual problems. Through continued research and collection of knowledge concerning soil and plant chemistry, the "future farmer" will be an intelligent "chemical farmer" and will produce safe, contaminant-free foodstuffs.

Senior (at a football game): "See that big substitute down there playing quarterback? I thing he's going to be our best man next year."

Coed: "Oh, darling, this is so sudden."

Hort Club News

DAVE WALKER

The Hort Club has gotten off to a very good start this year. While we did lose a few members, we gained fourteen new freshmen. We hope that next year our membership will be even larger.

The projects of the club this year for making money are the sale of apple and grape juice and some grape jelly. Since the peach crop was killed this year, we decided to try making juice and so far we have done very well.

The main event that the Hort Club is working toward this year is the trip to Dallas. This will occur in February when the Southern Ag Workers hold their convention. The members will meet with other collegiate branches of Horticulture Clubs from different states.

The officers for the Hort Club 1964-65 are Butch Ferree, President; Ronald Burnett, Vice President; Loren Brogdon, Secretary; Arthur Pfister, Treasurer, and Dave Walker, Club Reporter. Last year's president, Ronnie Robbins, is now at L. S. U. doing graduate work.

The members of the Hort Club are divided into two majors — Ornamentals and Fruit and Vegetables. Both of these fields play an important part in the business world as well as the private residence. Students and grad-students in these two fields are in great demand and their need is growing larger and larger as the population increases.

Dave Walker
Club Reporter

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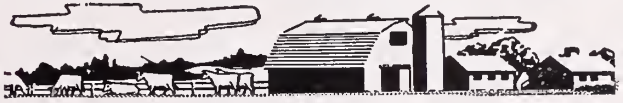

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REMEMBER, an ounce of loyalty is worth a pound of cleverness. If you must growl, condemn and eternally find fault, resign your position and when you are on the outside, damn to your heart's content; but as long as you are a part of the institution, do not condemn it; if you do, the first high wind that comes along will blow you away and probably you will never know why.

—Elbert Hubbard

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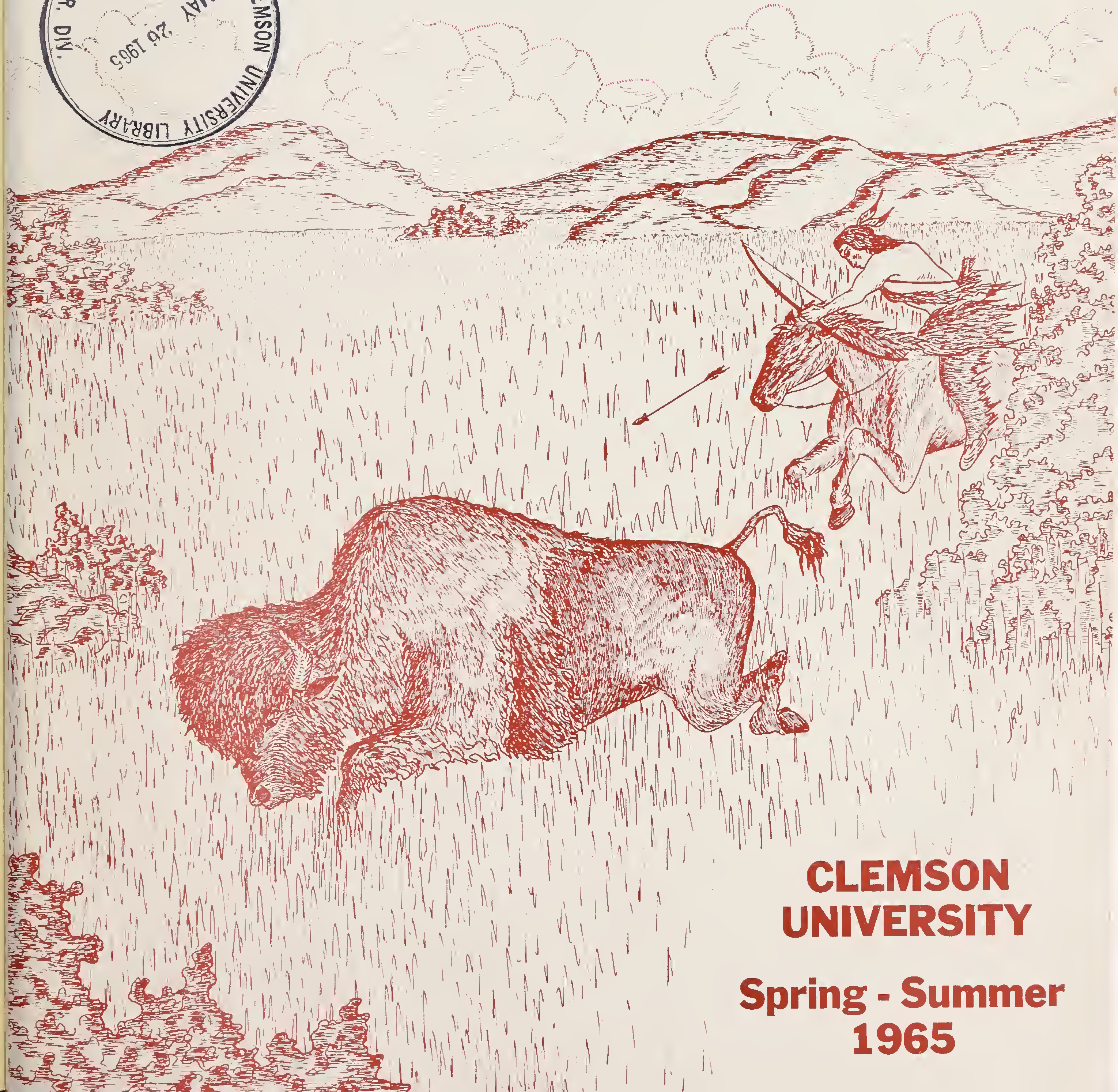

CLEMSON UNIVERSITY

Spring - Summer 1965

NOW! YIELD + QUALITY

In the long successful push for production of crops — first gaining impetus during World War II, followed by the demands here and abroad, quality of crops was somewhat forgotton. This push for production has been translated to a production per acre basis with many crops as a result of federal acreage controls. Fortunately, with some crops the two go more or less hand in hand. With others, unfortunately, high production is gained somewhat at the expense of quality.

A case in point is tobacco. Production per acre has increased. Quality has gone down. Problems have been created in satisfactorily meeting the requirements of domestic manufacturers or attempting to compete in the world tobacco market.

A question logically arises. Federal program be what it may are we fully applying the know-how which research with fertilizers has revealed about growing **both** high yields of flue-cured tobacco and quality leaf. The answer is — not fully. I refer to recent work in South Carolina and in adjoining flue-cured growing states on amounts and forms of nutrients. This work has been recognized by The Tobacco Workers' Conference in their current recommendations for growing flue-cured tobacco. Results from these extensive experiments call for fertilizers containing —

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It is NITRATE OF POTASH.

Rodger C. Smith
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THE AGRARIAN

CLEMSON, SOUTH CAROLINA
SPRING - SUMMER — 1965

Volume XXII — Number 2

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THE COVER

The untamed West? No. A bit of history is represented by the drawing on the cover of this issue. The South Carolina as the early colonists knew it resembled very little the cleared, cultivated, and inhabited country that we are acquainted with. And it is an error to imagine that the whole surface of the state was covered with unbroken forests, canebrakes, and thickety swamps. In many places then were extensive open plains, or savannas, and these were covered with grass upon which grazed herds of deer and buffalo. It has been said after that no buffalo existed east of the Alleghany Mountains, but the evidence to the contrary is very clear.

The early Spanish explorers spoke of the "great hump-backed oxen"; James Glen, one of the early governors, also spoke of them. But even if such direct testimony were lacking, the common use of the name, such as Buffalo Creek, Buffalo Springs, and so on, all through the upper portion of the state, would point unmistakably to their presence. Although their name has lingered and their bleached bones and deep-worn trails long remained as evdence of their numbers, they were the first large game to disappear, and the elk soon followed. In addition to elk and buffalo there was also to be found deer, wolves, wildcats, panthers, bears and beaver.

Cover story and design by staff artist Bob Upson.

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AGRARIAN PHILOSOPHY

This semester is the last lap for the Seniors. After nearly four years we must face the cold, cruel world on our own. If one were to ask each of the approximately sixty-five graduating seniors for an analysis of his college career or a bit of advice to freshmen and other underclassmen, I'm quite sure he would get sixty-five entirely different viewpoints.

Studying and academics is only part of one's education. Surely these are important parts and are, in fact, the reason for the establishment of the University but they are only a part of the overall picture.

One of the most beneficial aspects of an education is the associations with other people—both faculty and students. At a university such as Clemson, one comes in contact with people from all walks of life. He has an opportunity to meet peope with entirely different points of view from his own. By associating with these individuals his horizons are greatly broadened.

Living off from home for four years is also an important phase of one's education. He must learn to budget his time and his finances. No one is present to tell him what to do and when to do it, he must depend on his own judgment. This is a new experience for most individuals and one which has a great effect on later life.

Extra-curricular activities play an active part in one's education. By working in student organizations one can develop his leadership potential and can express his own views. When an individual accepts an office in an organization he accepts a certain amount of responsibility with it. The members have expressed their faith in his ability to do a particular job, and anything less than the very best the individual can do will betray their trust. By accepting these responsibilities the individual accepts the trust of his fellow members, but only by meeting these responsibilities can he justify their trust in him. Many times he must sacrifice his own pleasures for the benefit of the group but he should realize this before he accepts the responsibility. Learning to make these personal sacrifices for the organization is part of an education.

There are many other aspects of an education. The important point is to develop all of them rather than just one. For an individual to be successful in life he must have a well-rounded, balanced education. JCW

FFA News

On September 29, 1964, the annual FFA cookout was held at the Food Industries Building. Over 50 membres and faculty advisors attended. Dr. Davis, Head of Agricultural Education Department, spoke to the members present. He also mentioned some problems which new vocational agriculture teachers are likely to confront.

Hugh Caldwell, President of FFA Chapter, represented the Clemson University Chapter at the National FFA convention in Kansas City. Af-

(Continued On Page 9)

Insects And Sound Waves

BOBBY VAN HOOK, Entomology

Sound strange? In the next few years sound waves may become one of our more important control measures for certain insects. Experiments are now being carried out at several USDA Entomology Research Stations. One such place is the Cotton Insects Research Division at Pee Dee Station in Florence. Here, under the direction of Dr. H. M. Taft and Mr. H. R. Agee, work is being done with the cotton bollworm moth.

There are several groups of insects that are responsive to sound. The more important group is the Noctuid family of moths, to which the cotton bollworm moth belongs.

It has been known for some time that bats using a type of sonar locate moths and other insects for their meals. Some of these insects such as the cotton bollworm moth have evolved counter measures against the bat's sonar.

The cotton bollworm moth has a tympanum located on each side of the body just under and behind the rear wings. This is the organ that is responsive to the ultrasonic sound waves of the bat. When the moth hears the bat approaching it will either fly off in the other direction or dive to the ground in an attempt to escape.

The object of this experiment is to simulate artificially the sounds produced by the bat. This could be used as a control measure by keeping the moth out of the cotton fields. This experiment requires a great deal of preliminary work that is being carried out this winter. When summer comes, the experiment will be taken out in the field to be tested on the moths in their natural environment. Who knows? In the next several years we may be using sound as a measure to control this pest and possibly certain others.

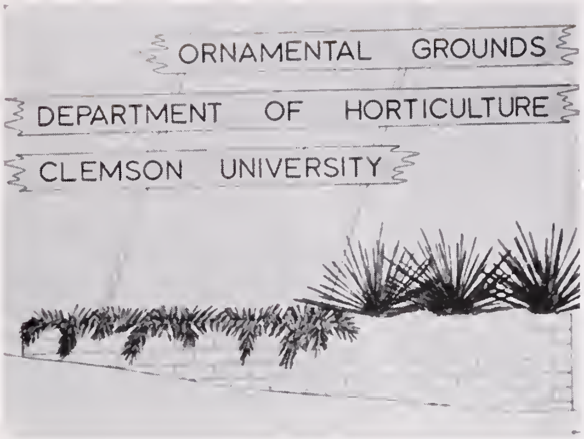
ASAE News

The South Carolina Student Branch of the American Society of Agricultural Engineers is looking forward to the annual University of Georgia - Clemson University banquet to be held at Georgia in the very near future. In addition, plans are being made for a field inspection tour of facilities of Tennessee Valley Authority, United States Atomic Energy Commission, and Athens Plow Company in Eastern Tennessee.

This year the club has gained six new members while losing two via graduation and change of major.

Gene Rochester, '65, club president and second vice-president of the National Council of ASAE; and Bobby Morgan, '65, represented the club at the annual Winter Meeting of the National Council in New Orleans, Louisiana, in December.

HAROLD ALLEN



A DREAM COMES TRUE

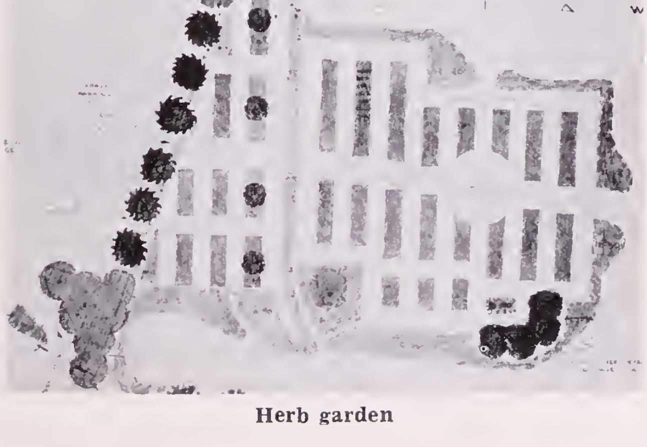
BOB UPSON, Horticulture, '65

For a long time now, the Horticulture Department at Clemson University has realized the necessity and desirability of a designated area for both research and the display of ornamental specimens commonly grown in this section of South Carolina. This area would provide many of the much needed facilities for study in the field of horticulture and specimens would be made available for the study of plant material.

The field of horticulture is quite broad and it would be quite a task to bring together in this relatively small area a valid representation of this field. Yet this is what we in the Department of Horticulture at Clemson are doing in this area we call the "Ornamental Grounds." In addition to serving as a valuable part of the teaching program, this area will be convenient to the campus and will serve in the interest of the public of South Carolina and surrounding states.

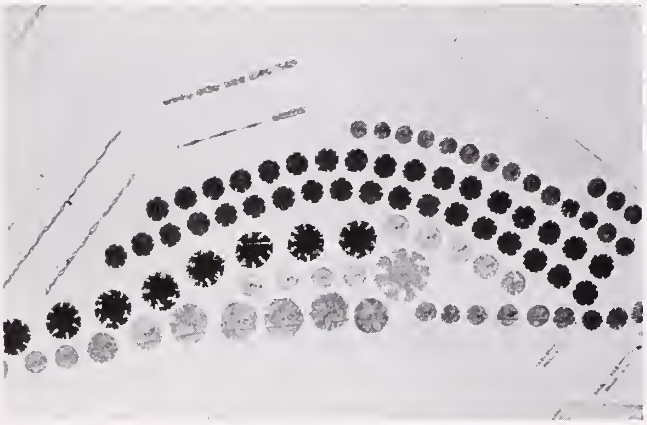
The present area set up for research is located about a mile and a half from the R. F. Poole Agricultural Center of the College of Agriculture. This area of approximately twenty-seven acres is located on moderately rolling ground surrounded by several wooded sections of natural pine and hardwoods. Located within this area is a one-acre run-off pond which serves to irrigate the entire grounds.

Obviously, if this area was to be developed, a general plan was needed since prior to this time building and planting has been done on a "here is a good place" basis. Designing came through the teaching part of the university program when the planning of this area was turned over to the seniors in an advanced landscape design class.


Herb garden

In the fall of 1964, starting with this area along with the present greenhouse, cold frames, tea house, lathe houses, Camellia collection and a briefing on the general needs of the area, the students tackled the project. The plans were to include an organized shrub collection, Camellia collection, rhododendron and azalea collection, ground cover specimens, an herb garden, areas designated for research and plant introduction, tree specimens and a building for storage of equipment. A shrub collection of sort had been started, but no specefic plan was being followed. Also, if this area was to be a showplace for the public, sufficient parking must be provided for.

The class of eight seniors had completed their plans by the end of the fall semester and had come up with many interesting ideas and suggestions concerning the area. Throughout the entire plan a strong effort was made to display various species of material in their natural surroundings and as a result tree and shrub specimens enhance the parking facilities as well as the peripheral boundary. Ground cover plots are placed in their natural settings of both sun and shade. The existing shrub collection is to be rearranged and expanded to include over three hundred plants with room for further expansion.


Fruit tree collection

Plans were also drawn up for an attractive sign to introduce the "Ornamental Grounds," and a design was submitted for a welcome center located at the main entrance to the grounds. This welcome center would supply all visitors with information about the grounds and would include a list of plant material provided. Also, to be lo-

(Continued On Page 15)

Agriculture: A Major Contributor In American Growth

GENE W. DUKES, Agricultural Economics, 1965

If one would take time to examine the great nations that exist, and have existed, on this Earth, he would discover that they all have followed practically the same course of economic development. At first these countries would consist primarily of people who had only one objective in mind—that of providing the necessities of life for themselves and their families. Thus, the economy of a developing country in its early stages is almost entirely agricultural. As the country continues to develop, the agricultural sector of its economy will become smaller, and that portion of its population devoted to fulfilling the less urgent needs of its people will become larger. It should be evident, with a little knowledge of history, that this is the course of development our country has followed.

The United States of America established by the ratification of the Constitution consisted almost entirely of citizens who lived and worked on farms. The efforts of these people were aimed mainly toward survival. They produced very little that was not consumed by themselves. Today, however, this same United States of America is the most prosperous nation this world has ever seen. Our gross national product is over 600 billion dollars, and American citizens enjoy a level of living superior to that of any great civilization, past or present.

Who or what has been responsible for this development? This, I believe, is a question that cannot be answered easily. There have been many forces which have contributed to this growth. It would be difficult, in fact I believe it would be foolish, for anyone to try to attribute this development to any single sector of our economy. I do not think, however, that it would be foolish at all to attribute a sizeable portion of this success to the American farmer. A brief look at the history of agriculture in America will make this evident.

The early American farmer had to put in many hours of back-breaking labor just to produce enough food and fiber to sufficiently satisfy the needs of his own family. As the farmer gained experience in the art of production, he was better able to evaluate and adapt new techniques and to make improvements in his old techniques of production.

Research and creative thinking in many different areas has poured forth new methods and implements, all of which have been cordially received by the farmers and incorporated into his farming program. The farmer operating under our competitive, free enterprise system has sought earnestly to improve his managerial ability, and in turn to make the most of the resources available to him.

The farmer has progressed from his old subsistence level to a point, at present, where one farmer can produce enough to feed himself and 32 other people. The increase in agricultural production has been so tremendous that it has outstripped our population growth and has given rise to the surpluses we hear so much talk about today.

This great increase in efficiency of production on the farm has cleared the way for labor to enter industry with the assurance that they will have adequate food and fiber to meet their needs. This labor has been utilized to such a degree that today American industrial production stands second to none.

The farmer has not only contributed to American growth by expanding his output, but he has also been instrumental in the development of a sound political system. It was largely an agrarian effort which compelled the British to relinquish their control over the Colonies, and many of the men who met in Philadelphia in 1787 to draft our Constitution had derived their living from the soil.

The farmer has always been a source of patriotism in the struggles which have confronted us. He has always maintained a belief in individual freedom and dignity, and has devoted his efforts toward maintaining these as highly prized possessions for all Americans.

(Continued On Page 17)

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OUTSTANDING ALUMNUS

JOHN D. RIDLEY, Feature Staff

Dr. George Herman Wise, Professor of Animal Industry at North Carolina State of the University of North Carolina, Raleigh, North Carolina, is now president of the American Dairy Science Association. He was the recipient of the Bordon Award in Production for 1949. Dr. Wise was born and reared in South Carolina. He received his B.S. degree from Clemson Agricultural College in 1930, and his M.S. and Ph.D. degrees from the University of Minnesota in 1932 and 1936, respectively.

Dr. Wise has held the following positions since graduation from Clemson, Assistant, University of Minnesota 1934-36; Associate Dariy Husbandman, Clemson Agricultural College 1936-1944; Associate Professor of Dairy Husbandry at Kansas State College 1944-1947; Assistant at Iowa State College 1947-1949 and since April 1949 Professor of Animal Industry at North Carolina State, in charge of the nutrition section.

During student days he was characterized by the thoughtfulness of his preparation in both study and research work. Since completing his graduate study he has continued to exhibit those same qualities in his research activities. An important contribution made by Dr. Wise was his series of comprehensive studies upon the physiology of gastric digestion in the calf. These include the various factors affecting the passage of liquids into the rumen of the calf and the changes in milk products that took place when milk was slam-fed. His more recent studies include the effect of the preparation diet of the cow on the vitamin A and tocopheral content of colostrum and milk in the early post-colostrum period and upon the vitamin A storage in the new born calf. He received the American Feed Manufacturers Association Award in 1948 for his series of publications on the latter work.

Dr. George Herman Wise

Dr. Wise has been active in the American Dairy Science Association, having served as chairman of the Production Section in 1948 and Associate Editor of the Journal of Dairy Science. In 1964 Dr. Wise was Vice President of the American Dairy Science Association and succeeded to the Presidency in 1965.

It is with pleasure that the AGRARIAN presents this profile of an outstanding Clemson alumnus.

Forestry Club News

The Forestry Club at the present time is cutting pulpwood in order to go to the regional conclave of Forestry Clubs which will be held at N. C. State College at Raleigh, May 1, 1965. This represents much time and effort as well as planning by the host club. Events include dendrology, wood technology, and other technical events as well as the standard field events of log burling, axe chopping and sawing. Proficiency in these events is necessary in order to win in the regionals and a local conclave is held in order to select the best trained boys. This local conclave is to be held April 9, 1965 and will include a banquet and club initiation as well.

AG COUNCIL NEWS

The Agricultural Council has made several recommendations to Dr. Jones' office this year. One of the suggestions concerned the formation of an Agricultural Social Fraternity. It was the unanimous opinion of the group that such an organization can serve a useful purpose on the Clemson Campus.

Another suggestion pertained to the lack of knowledge of requirements which must be met by all student organizations. The Council recommended that an attempt be made to make all club presidents aware of their responsibilities in this area. The suggestion was sent through Dean Wiley's office to the Student Senate.

On April 3, 1965, the Agricultural Council held its first annual banquet. A very nice steak supper was served to the group at the El Dorado Restaurant. Dr. and Mrs. Stembridge, Dr. and Mrs. J. W. Jones, and Dr. and Mrs. W. H. Wiley were guests of the group and Dr. Wiley was the speaker. There were about 25 people in attendance, including wives and dates of the members.

Creep-Feeding Beef Calves

WILLIAM J. RUFF, Animal Science, '65

In recent years there has been an increased interest among commercial cattlemen as to the advisability of creep-feeding beef calves—that is, provide a grain ration to suckling calves in an enclosure accessible to the calves but not to their dams. The increased interest has resulted in several experiments to study the value of creep feeding. Studies have been conducted at the South Carolina Experiment Station over a five year period to determine the feasibility of creep-feeding calves. Research has been conducted with over 800 Angus and Hereford calves at the Clemson and Coast stations and is being continued at the present time. Preliminary figures indicate an average increase in gain resulting from creep-feeding of 30 pounds. Also, average daily gain was increased from 1.66 to 1.79 lbs. with an improvement in grade of one-third. Animal Scientists at the Oklahoma Experiment Station, as well as many other experiment stations, report similar results.

Research has been conducted at the Oklahoma Experiment Station to study the value of creep-feeding steers and heifers to be sold at weaning or followed by dry-lot fattening for the steer calves. An experiment was also conducted with calves whose dams were two years old when they calved.

Creep-feeding consistently produced fleshier calves at weaning. The average increase in gain resulting from creep-feeding was 30 pounds. An average of 363 pounds of feed was consumed per calf. The value per calf minus the feed cost was in favor of not creep-feeding when the calves were sold at weaning as stockers or feeders. However, creep-feeding would have increased profits if the calves had been sold for slaughter at weaning. Creep-fed calves may in many instances actually sell for less per hundred weight as feeders than the same quality of calves not creep-fed. Unless the creep-fed calves are continued on a high level of feed they will lose the extra condition and bloom obtained with creep-feeding. Many cattle feeders who desire to utilize fall pasture or simply winter their calves on a roughage program do not feel that it pays to buy calves with extra condition since they usually lose it when handled according to this plan. The added weight the feeder has to buy may only result in lower gains while in the feedlot.

Results at the Oklahoma Experiment Station indicate that it was more profitable to fall-feed fattening rations in dry-lot to steers which had not been creep-fed than those which had been creep-fed, when they were fattened to approximately the same slaughter grade. The creep-fed steers were marketed 19 days earlier than those which had not received supplemental feed. However, the fleshier creep-fed calves gained at a slower rate in the feed lot and at a slightly higher feed cost per 100 pounds of gain than the non creep-fed ones.

The results of creep feeding and wintering heifer calves showed the creep-feeding to be an unprofitable practice. The heifer calves which had been creep-fed gained an average of 37 pounds more during the summer than those which were not creep-fed. But those which had been creep-fed gained 33 pounds less during the winter feeding period than the non creep-fed heifers. Thus, the increased gain from creep-feeding resulted in decreased gains during the wintering period. Due to the added cost of feed for the creep-fed heifers the non creep-fed animals were more profitable.

The only experiment on creep-feeding calves at Oklahoma which proved to be profitable was the creep-feeding of calves whose dams were two years old when they calved. The reverse was true, however, when the cows produced their sec-

(Continued On Page 24)

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Forest Fertilization

RANDY BROOKS, Forestry, '68

Foresters of today are experimenting with fertilizers and organic nutrients to improve the forests, just as farmers use fertilizers to improve their crops. The natural forest circulates nutrients through the decomposition of roots, bark, limbs, and leaves on the forest floor, and the consequent uptake of these same nutrients by the roots. Through the neglect of man much of the organic layer from many forest areas has been removed. Poor agricultural practice, fire, and erosion are chiefly responsible for the depletion of humus in the forest. In such areas forest fertilization has brought very good results.

One of the major questions concerning the success of forest fertilization is whether or not the results obtained are worth the money invested. Conditions that often make fertilization profitable are low costs of application, low initial costs of land, and growth returns of a high enough magnitude to cover costs. Research will give us more information on the most profitable ways to make fertilization pay.

Improvement in wood quality and seed production are two of the most important goals of forest fertilization. Some scientists believe that the addition of plant nutrients improves sexual fertilization of trees, thus increasing seed production. As a result of fertilization, tracheid length and wall thickness are increased, thus causing a greater wood density, which is a desirable characteristic of wood. Increased seed production and better quality wood mean more trees at a better price.

Nutrients are used mainly on young seedlings, although they are also being tested on older trees. As a general rule, it seems that the older the stand, the less successful the fertilization. The reasons for this are that the growth of old trees has slowed to the point where they can no longer respond to fertilizers, and also the methods of measuring growth on old trees are crude. Seedling nurseries are the primary places where fertilization experiments are being carried out. The three principal elements in the fertilizers used are phosphorous, nitrogen, and potassium. These are mixed in varied proportions along with several minor elements in order to get the desired results. Tests are frequently made of nursery soils to determine which elements are deficient

(Continued On Page 24)

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Excess Chlorine In Flue-Cured Tobacco

SIDNEY FARMER, Agronomy, '65

Tobacco growers in South Carolina are becoming more aware of the problem of excess chlorine in tobacco. Excess chlorine gives an off-quality, off-type tobacco which is difficult to sell.

Chlorine is the latest element to become firmly established as an essential micronutrient for higher plants. In the tobacco plant chlorine may have decided effects on the growth and quality of the leaf when absorbed in sufficient quantity.

When the chlorine content of the green leaf rises to four or five per cent, normal carbohydrate metabolism may be seriously disturbed. The leaf becomes greatly thickened, exceedingly brittle, with a marked accumulation of starch, which will not convert to sugars in the curing process. Also, the leaf margins curl upward, and the leaf surface presents a distinctive sleek, glabrous appearance. Recently research was completed at North Carolina State University showing the effects of excess chlorine on tobacco. This tobacco was very striking in physical appearance. It was sunbaked on the bottom of the plant and immature in the middle part of the plant. This sunbaked tobacco, when cured, may be described as being muddy, or showing uneven color. Immature tobacco, when cured, will have a distinctive slick shiny appearance. Also, excess chlorine is believed to be responsible for the sort of leaf commonly known as "wet dog," a product which continues to darken and develops an undesirable odor after having been redried and packed in the hogshead for aging. Usually this sort of leaf comes from the lower part of the plant.

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A small amount of chlorine is advantageous to the growth and quality of the leaf, and causes no apparent injury to the burning qualities. The principal effect of chlorine in the growing leaf is to increase the water content and turgor of the cells, which produces a larger, smoother, thinner leaf. This increased water content and turgor often functions in preventing necrosis in the leaf due to dought, the more usual form known as "drought spot." On light soils of low water-holding capacity, this protective action may result in adding materially to the commercial value of the crop. The effect of a moderate amount of chlorine in the tissues in inducing the development of a leaf having a greater spread, lighter green color, and smoother surface may be attributed to the drought-resistant properties imparted by the chlorine.

The adverse effects of excessive chlorine were vividly demonstrated by research conducted in 1964 by the North Carolina Agricultural Experiment Station as shown in Table 1.

Table 1. Influence of Fertilizer Chlorine on Properties of Flue-Cured Tobacco

Fertilizer Cl lbs/A	Yield lbs/A	Ave. Price dols/cwt.
0	2011	57.64
30	2214	57.24
60	2186	53.13
90	2176	53.48
120	2257	50.98

At 60 and 120 pounds of chlorine per acre the average price of the cured leaf was reduced seven and eleven per cent below that at the 30 pound rate. Also, with rates above 30 pounds per acre the color, texture, and other characteristics were considered extremely undesirable by domestic and export tobacco companies.

Similar research at the Pee Dee Experiment Station, Florence, South Carolina, indicates that chlorine in excess of 30 pounds per acre is detrimental to the physical and burning quality of tobacco. The higher chlorine rates produce a more hygroscopic tobacco.

To help reduce excessive chlorine in tobacco, the Agronomy Department at Clemson is asking the fertilizer manufacturers in South Carolina to voluntarily reduce the chlorine in both complete and side-dressing tobacco fertilizers, so that it does not exceed two per cent. Previously the chlorine content in complete fertilizers ranged up to three per cent, and in the side-dressing fertilizers the chlorine content was as high as five per cent. The tobacco fertilizer can very easily be a source of excessive chlorine for the plant.

In addition to the chlorine furnished in tobacco fertilizers, the chlorine supplied to the soil by soil fumigants must also be considered. Research conducted at North Carolina State University has shown that additional chlorine and/or

(Continued On Page 14)

Student Teaching In Vocational Agriculture

HUGH CALDWELL, Agricultural Education, '65

Why do Agricultural Education majors look forward to their spring semester of their senior year? There are two possible reasons: first, it is the final semester in college for many of them, and secondly, and probably most important, it's the time they get their first experience in teaching.

The first eight weeks of the second semester is a block schedule at an accelerated rate. During this period courses in Music Appreciation, Health Education, and Agricultural Education are taken. During this time students learn the theories of education, collect teaching materials, and make lesson plans. Then comes the eight weeks of the real thing—"Directed Teaching."

For the actual teaching experiences, the students divide up into pairs. Each pair goes to a school or training center for their directed teaching. Their training in these centers is supervised by the local Vocational Agriculture teacher, known as the supervisory teacher, and by the Agricultural Education staff at Clemson University. There are twenty training centers in various sections of the state. These schools are used on a rotated basis rather than used continuously. The ones to be used this year are: Conway, Indianland, Loris, McBee, Pelion, Pendleton, Saluda, Southside (Florence), Wade Hampton, and Wagner. Other schools which have been used include: Allendale, Bells, Crescent, Daniel, Darlington, Fort Mill, Hollywood, Pickens, and York.

The first week of the student teaching period is largely one of observation, planning, and learning the school, its administration and some of the people of the community. Beginning with the second week, the student teachers usually take definite responsibilities with both in-school and out-of-school classes.

Teaching assignments include various types of classes, such as, classroom, field, and shop. Visiting farm people, adults and boys, is definitely a part of the program. Much of this is done in the afternoon after classes are over.

The purposes of these visits are to become more familiar with the in-school students as well as their parents, to learn the farmer's needs, and to make farm surveys. Evening classes are conducted also with the young and adult farmers.

It is a period in which student teacher learns by doing. They have the opportunity to observe others teach and teach before others. Although this is a busy period, all of the student teachers enjoy it, and develop considerable enthusiasm about teaching.

Alpha Tau Alpha News

Alpha Tau Alpha, the honorary Agricultural Education fraternity, held a regular meeting during the month of March. The meeting agenda included initiation and acceptance of new members as well as election of new officers. All prospective members were accepted and the new officers for 1965-1966 are:

President—Steve Logan; Vice President—C. E. Poindexter; Secretary-Treasurer—Tommy King; Sergeant at Arms—David Coile.

He: "Where'd you get that dress?"
She: "Do you like it?"
He: "Yeah."
She: "It's really nothing"
He: "That's why I like it."

FFA

(Continued From Page 2)

ter he returned he gave a brief summary of the activities of the convention.

On November 19, 1964, a Leadership Training Program was presented by members of the Clemson FFA Chapter. The purpose of this program was to help train high school FFA officers in their duties as officers. Also their local chapters program of work was discussed. Officers from eight schools in Pickens, Oconee, and Anderson Counties attended.

Wayne Coward, Vice President of FFA chapter, represented Clemson University at the Youth Day Program held at the State Fair in Columbia.

Dr. A. K. Jensen and Hugh Caldwell were guests of the Spartanburg Federation annual Father-Son banquet on February 22, 1965.

Each year the Collegiate Chapter has its annual banquet in the spring semester. This year it was held on March 11, 1965, at the Southerner Restaurant. There were 49 members present including the Agricultural Education Staff and their wives, Dean and Mrs. W. H. Wiley, and Dr. and Mrs. J. W. Jones. Dr. U. S. Jones, Head of Agronomy and Soils Department at Clemson University was the guest speaker. Each year at this banquet, achievement awards are given to the outstanding Junior and Senior in the FFA. Receiving these awards for 1964-1965 year were: Junior — Jim Barnette, and seniors—Al Berry and Hugh Caldwell.

On March 2, 1965, new officers for 1965-1966 were elected. These officers elected are: President—Jim Barnette; 1st Vice President— David Coile; 2nd Vice President—C. E. Poindexter; Secretary—Steve Logan; Treasurer—Thomas King; Reporter— George Gore; and Sentinel— Larry Smith.

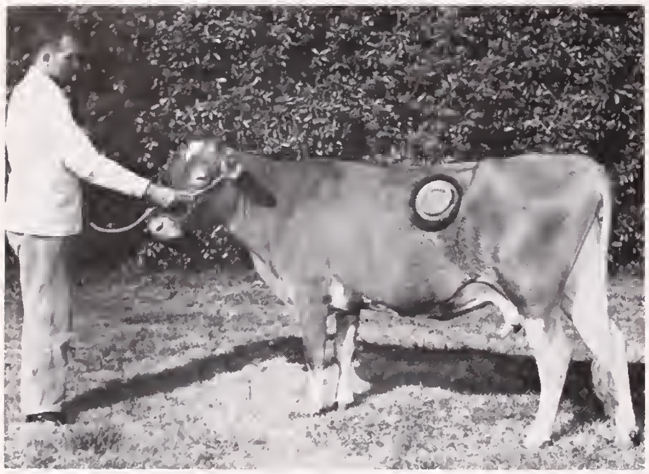
HUGH CALDWELL

The Rumen And Its Functions

GENE MERRITT, Dairy Science, '66

As a cow takes food into her mouth she chews it and compacts it into three or four ounce wads called boluses. Upon the formation of a bolus, it passes down the esophagus to the rumen.

The rumen is one of the most important sections of a cow's digestive system. This compartment has a capacity of approximately fifty gallons, or as much as three hundred pounds of material. The rumen has three main duties with interrelated functions.



This animal with the fistula through the rumen wall is used at Clemson for digestion studies.

The first function of the rumen is to act as a storage place. The rumen holds all the feed taken in by a cow when she is fed or when she grazes. After she has finished feedings and is resting, she regurgitates the largest particles back to the mouth, to grind them more completely.

This photo shows a closeup of the rumen contents being removed for analysis.

Next, the rumen is able to refine coarse food. The rumen is made up of muscular membrane covered with many pointed papillae and half filled with water. Due to the action of these forces, the feed is soaked, churned about, and returned to the mouth for further mastication. Thus, by churning, soaking, and rechewing, the particles are greatly reduced in size for better action of digestive juices and bacteria.

The third function of the rumen is to provide a place for fermentation. During the twelve hours that the feed stays in the rumen, many important changes take place. These changes are brought about by the action of bacteria and yeast. The temperature, food, and moisture of the rumen are so combined as to provide ideal conditions for growth and multiplication of these organisms.

(Continued On Page 18)

In the lab, the rumen contents are analized to determine the digestability of the ration.

Pre-Veterinary Club News

The spring semester is a period when the upperclassmen in Pre-Veterinary Medicine anxiously await official news of whether or not they have been accepted to the School of Veterinary Medicine. This is the time for aptitude tests, interviews by a team from the School of Veterinary Medicine, and finally hoping for a letter of acceptance from the school.

The Pre-Veterinary Club sponsors each year a trip for the upperclassmen to the State Livestock - Poultry Disease Diagnostic Laboratory in Columbia. This was a very interesting trip this year. The students had an opportunity to hear Dr. Boyd, Director of the Laboratory, outline the lab program and then the students were taken on a tour to see the various functions performed in the lab. On April 2 the students visited the School of Veterinary Medicine at the University of Georgia for the annual "Open House." This proved a most valuable experience as it gave the students an insight into the school and also allowed some time to discuss some of the aspects of Veterinary School with the professors and students. On March 23 two former Clemson Pre-Veterinary students now enrolled in the School of Veterinary Medicine presented a very informative talk at the club meeting. It has been a practice of the club to have some of the former Clemson students speak to us each year. The annual banquet is scheduled for April 27.

All students interested in Pre-Veterinary Medicine are invited to become a member of the club.

DENNIS B. VOSO

Ag Econ Club News

This semester, the Agricultural Economics Club has been very active, not only in Club business, but also in the area of speakers at our meetings. Agricultural Economists, Dr. L. E. Talbert and Mr. D. E. Crawford spoke to us on the importance of Economics in Agriculture. Fellow Club member Gene Dukes gave us chosen excerpts from a speech he gave at the American Farm Economic Association public speaking contest, Purdue University, Lafayette, Indiana.

At our meeting on the 10th of March, American Farm Economic Association certificates were given to all members. This is the first time that the Club has offered a membership certificate of any kind.

At one of our bi-weekly meetings, the members voted on, and passed, a motion to have a candy sale. The candy was distributed among the members, who have done an outstanding job of selling it. At the completion of the sale, the club will have realized a profit of $53.00. The candy sold so well that Club President Marshall Dantzler is considering another sale.

All activities of the Ag. Econ. Club for the remainder of the semester will be directed toward the publication of its annual brochure recognizing its seniors and graduate students, and its Annual Student-Faculty Banquet held on the Friday night of Junior-Senior dance weekend. The purpose of this banquet is to promote good relations between the students and the faculty. The Members of the Club and their dates are looking forward to an enjoyable evening with the faculty and their wives.

FRANCIS L. KAPP

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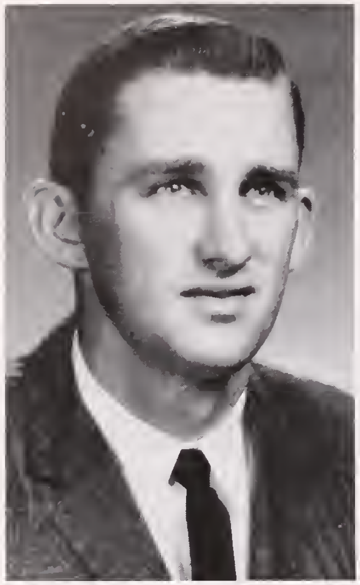

ALVIN NELSON BERRY

Al Berry, an Agricultural Education major, is from Ward, South Carolina. He attended Saluda High School where he was a member of the Beta Club and played football and basketball. He attended Furman University for one year and played football there. At Clemson Al has been a member of the Pershing Rifles and the FFA of which he served as Treasurer and Chairman of the FFA Calendar Committee. He was also elected to membership in the Alpha Tau Alpha and Alpha Zeta Fraternities. He has maintained a cumulative GPR of 2.7. Al is doing his practice teaching this semester at Wagener.

DANIEL DAVID BOZARD

Dan Bozard is a native of Orangeburg and a graduate of Orangeburg High School. He is an Animal Science major. While in high school he was quite active in his local and county 4-H Clubs and won a trip to Chicago. At Clemson, he has been a member of the Block & Bridle Club for four years, has served as its secretary and is presently serving as President. He is also serving as Vice-President of the 4-H Club and Vice Chairman of the Ag Council. He participated on both the livestock and meats judging team. Dan has maintained a 2.33 cumulative GPR and was elected to membership in the Blue Key National Honor Fraternity.

LOREN JOHN BROGDON

Loren Brogdon, a Horticulture major, is a native of Little Silver, New Jersey. As a freshman he received the Danforth Freshman Award. He is a member of Phi Eta Sigma, Phi Kappa Phi, Clemson Glee Club, Arnold Air Society and Scabbard and Blade. He has served as Secretary of the Horticulture Club and is presently serving as Scribe of Alpha Zeta. Loren has maintained a 3.3 cumulative GPR and was designated a Distinguished Air Force ROTC Cadet.

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practice teaching. Every member of t
based on leadership, character, person

MRS. LINDA JONES MA

Linda Marganian is a nativ
Hills, California. Before enteri
her sophomore year, she had tak
Fernando Valley State College a
Young University. She will get
in Biology this May and at the
complete requirements in educat
ing certificate. She has worked
assistant for the past two years a
secretary of the Biology Club.
work and school she keeps house
husband and is active in the Presl
Choir. Linda has maintained a cu
of 3.88 and plans to work towarc
gree in Zoology next year.

T HUGH CALDWELL

well, an Agricultural Education
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ksburg High School. In high
uite active in FFA and served as
ent. Hugh has been an active
Collegiate FFA Chapter and served
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a junior. Hugh has maintained
PR of 3.2. He is doing his practice
ıda High School.

JOE FRANKLIN SHEALY

Joe Shealy is a native of Saluda, South Carolina and graduated from Saluda High School. He served several years in the U. S. Marines before enrolling at Clemson in Forestry. His freshman year he received the Carolina Ginners Association Scholarship. Joe has served as a Hall Supervisor for two years. He is a member of Gamma Sigma Delta and is presently the President of the Forestry Club. He is a member of Alpha Zeta and is serving as treasurer. He is also Reporter of the Ag Council. Joe has maintained a cumulative GPR of 3.32.

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SHULER HILLER HOUCK

Shuler Houck, a Dairy Science major from Cameron, South Carolina, is specializing in the Production option. He received the Ralston Purina Scholarship for 1964-65. He is a member of the Lutheran Student Association, Alpha Zeta, and the Ag Council. He has served as Vice-President of the Dairy Club and Business Manager of THE AGRARIAN. In addition he was a member of the Dairy Cattle and Dairy Products Judging teams. Shuler is married to the former Olivia Heape of Fort Motte, and has maintained a cumulative GPR of 3.0. He was recently elected to membership in Gamma Sigma Delta.

GRARIAN staff with the exception of
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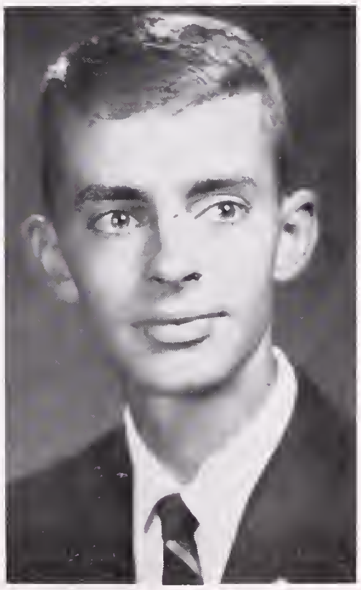
JAMES CARLYLE WILLIAMS, JR.

Jimmy Williams, a Dairy Science major, is from Norway, S. C. He received the Gamma Sigma Delta Sophomore Award, the Danforth Award for Agricultural Seniors and the Borden Agricultural Scholarship Award. He has been elected to membership in Phi Eta Sigma, Phi Kappa Phi, Gamma Sigma Delta, Tiger Brotherhood and the Blue Key Fraternity of which he is Secretary-Treasurer. He has served as President of the Dairy Club, Chairman of the Ag Council, Chancellor of Alpha Zeta, and Editor-in-Chief of The AGRARIAN. Jimmy is a member of the Clemson Aero Club, is listed in both the 1963-64 and 1964-65 Who's Who in American Universities and Colleges, and is also serving as President of the National Student Branch of the American Dairy Science Association. He has maintained a cumulative GPR of 3.62.



EXCESS CHLORINE

(Continued From Page 8)

bromine is added to the soil in most of the fumigants applied to control nematodes. While the effect of these nematodes on the chlorine content of the leaves will vary quite widely, a reasonable estimate is that in many situations and with chlorinated hydrocarbons it will amount to the equivalent of 20 lbs. of chlorine per acre. Thus, the quantity of chlorine applied even at minimum rates of fertilizer for tobacco may exceed the recommended level, and at the higher rates of fertilizer which are frequently applied, it may be several times more than is considered advisable. As an example, the application of 900 pounds of 4-8-12 plus 200 pounds 8-0-24 to fumigated soils probably supply the equivalent of about fifty pounds of fertilizer chlorine. Under present fertilizer applications by tobacco growers, the rate of chlorine probably exceeds sixty pounds per acre on most fumigated soils.

In fertilizer, the demand for high rates of potassium, which gives good-burning quality to the leaf, along with the chlorine restriction has necessitated that a large part of the potassium in tobacco fertilizers be obtained from potassium sulfate and potassium-magnesium sulfates. Both of these materials contain considerable sulfur, as do ordinary superphosphate and ammonium sulfate, which are used in fertilizer formulations. The sulfur content of current mixtures used for fertilizing flue-cured tobacco is from twenty to thirty per cent SO3, equivalent, and the rates applied to a given crop are frequently equivalent to three-hundred to five-hundred pounds of SO3 per acre. Research at North Carolina State University has shown that sulfur equivalent to seventy-five to one hundred pounds per acre of SO3 is generally sufficient, with the higher rates being associated with a slower burning, denser tobacco.

Taking sulfur and chlorine into consideration potassium nitrate is of considerable interest as a material for flue-cured tobacco. A distinctive feature of potassium nitrate, besides being a source of potassium, is the very low content of chlorine and sulfur. Since soil funigants used for the control of nematodes reduce the rate of conversion of ammonium to nitrate nitrogen, potassium nitrate supplies the nitrogen in the nitrate form. It is now recommended that fertilizers for flue-cured tobacco contain at least thirty-five per cent of the nitrogen in the nitrate form because of the soil fumigants that are widely used.

Tobacco growers in South Carolina should carefully analyze their fumigation and fertilization programs to attempt to hold the application of total chlorine on the tobacco crop to a minimum for high quality tobacco.

Poultry Science Club News

At the first March meeting, the Club decided to invite Mr. Stan Marshall of Marshall's Poultry Farm to speak at the next meeting. Mr. Marshall accepted the Club's invitation and spoke to the group on March 22. He made a very informative talk on "The Opportunities of a Poultry Science Graduate."

The Club is planning to make a weekend trip to visit various poultry installations throughout the state. Both broiler and egg producing areas will be visited. The group intends to make on-the-farm tours as well as seeing the processing plants used in poultry production. Such a trip should enable the students to become better acquainted with all aspects of the poultry industry.

Here's a household hint on how to tell whether or not your goldfish is a boy or girl. "To the H2O add ½ ounce of H2SO4. If he comes floating to the top, he's a boy. If she comes floating to the top, she's a girl.

A city girl telling friends about her brother-in-law's farm said, "It's one of these experimental farms where the cows have calves without any bulls around. They call it artificial inspiration."

Worth Keeping in Mind — Duke Power's Free Agricultural Advisory Services

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Details on these and other services, designed to help you live and farm better electrically, are available at any Duke Power office.

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A DREAM

(Continued From Page 3)

cated in the close proximity of the existing greenhouse and other plant growing structures is a lecture area which will be shaded by pines and surrounded by beautifully blooming shrubs.

As far as fruits and vegetables are concerned, a section has been designated to contain various species and varieties of fruit trees, shrubs and vines including commonly known and unusual types. The herbaceous material has been laid out in a semi-formal design interlaced with walks and surrounded by fruiting shrub species.

Featured across the pond, which is inhabited by a flock of ducks for public interest, is a Japanese - style tea house to add a touch of the Orient to the atmosphere. A collection of bamboo has been placed in this area which is to be laid out in typical Japanese fashion. A small bamboo bridge will span a narrow segment of the pond which will be enveloped by iris and azaleas planted along its banks. Cypress trees planted in the edge of the pond will add to its reflective beauty.

Main section including lecture area, growing structure and main parking lot

Lake and tea house area

Surrounding the pond is a stand of pines underplanted with camellias, azaleas and rhododendrons with a series of trails winding throughout this segment. Also included under these pines are hardwood trees including dogwood, sourwood, redbud and sweet gum — chosen for their fall colors.

In conclusion, the ball is now rolling and the "Ornamental Grounds" are rapidly being developed. We in the field of horticulture are proud of our profession and we are proud to play the important role in the beautification of America. We hope that as these grounds are developed the residents of South Carolina will come to enjoy the area and, in so doing, acquire a deeper appreciation for Horticulture.

Dairy Club News

The Clemson University Chapter of the American Dairy Science Association began its spring activities with the election of officers. The new officers are as follows:

President—Gene "Knott" Merritt; V. Pres. — Jimmy Busby; Sec.-Treas.—Arthur R. Nichols.

The first regular meeting was held February 9, 1965, in the student center with Jimmy Williams and Gene Merritt giving reports on the Southern Regional convention which was held in Dallas, Texas. Nick Baskin was elected 2nd Vice-President of the Southern Region at this convention.

Jimmy Williams, president of the National Student Branch of ASDA, and member of the Clemson University chapter, has made plans to present each member with certificates and membership cards at the annual Awards Banuet which is to be held April 27, 1965.

The Dairy Science Club has enjoyed many interesting and informative speakers at each of the meetings. The members are making future plans for a work project and candy sale to earn money for the club. These funds are necessary so that the Clemson University chapter of ADSA will be well represented at regional and national conventions. The Dairy Club has also catered to fraternity luncheons held in the Food Industries Building. We the members of the Clemson University chapter of ADSA are interested in making our University better known in the nation through this organization.

Biological Science Club

This article is for the reading of non-members. This article is to point out what you have missed, because you did not join the Biological Science Club.

Non-members, you have missed one of the most entertaining and factual talks about snakes. This was a very informative program presented by a non-professional herpetologist, Mac Shealy. In addition, you have missed a lecture dealing with Egyptian Agriculture, which was also accompanied by an entertaining film. A very special lecture and movie about the work of the Peace Corp in Nepal was also missed by nonmembers.

Besides these interesting topics we have also had many revealing movies and discussions dealing with wildlife, their habitat, and their relationship to man.

We anticipate programs dealing with more and more interesting and very educational topics.

We extend a challenge to all non-members: Are you man enough to try it?

Jim Griffin

Poultry Meat And Eggs Are More Than A Bargain

NELSON E. McLOUGHLIN, Poultry Science, '65

The food industry has in the past few years made tremendous strides in building particular types of foods for the consuming public. Why should we consider poultry meats as a substitute for other meats? In addition to convenience and appearance factors in a meat product, we logically eat for the nutritional value. Because of the high nutritional value of poultry meat, it is one of our most useful food items. In general composition, poultry meat closely follows figures for beef or lean pork. At the present time, there is much emphasis placed on the fat content of the diet. In addition, we hear a considerable amount about the degree of saturation of the fats. Chicken fat from birds fed the usual commercial diets will usually fall about halfway between beef fat and corn oil products with regards to degree of saturation.

With respect to amino acids, poultry meat has been found to be extremely rich in lysine which is a limiting amino acid in many of our vegetable proteins. Because of the high nutritional value and particularly because of possibilities with regard to low fat and presence of unsaturated fat in poultry meat, they can be used in many places in the diet where usual animal products would not fit as well. For these reasons newer, more convenient poultry meat products are being offered to the American consuming public.

Let us consider eggs also at this point. Eggs are one of the most nutritious and versatile of our food products. They are used in appetizers, entrees, beverages, and desserts. They are used in warm foods, chilled foods, and frozen foods. They are available as shell eggs, liquid eggs, frozen eggs, and dried eggs. They are used for hundreds of purposes as in soups, custards, sauces, breads, meats, mayonnaise, candies, ice creams, noodles, flavoring, and such non-food uses as adhesives, leather industries, and many others.

Seeing the importance of poultry products in the American diet, let us consider these products as bargains to the consumers. Poultry meat and eggs have been introduced and promoted to fit the real consumer need and to fit into all economy sectors of the consuming population. Bargains come to the consumers as lower prices. Lower prices are due to increased specialization and production technology within the poultry industry. Bargains are hard to measure, however, in terms of money. Convenience in the preparation of meals, nutrition received from the product, satisfaction with the product, and time saved are just a few of the "bargains" the consumer may receive.

Today, about 37% of the food consumed in the nation is professionally prepared and served. There has been a 27% increase within the past 20 years. There are many reasons for this, such as increased travel for business and pleasure, increased school feeding, rapid rise in incomes, and longer livability that has created a large, almost exclusive "eating out" class of people that represents today more than 10% of the total population of the country.

Poultry products fit into the consumption picture quite well as a low price, quality foodstuff. To meet the demands of the public new forms of poultry meat and eggs are put on the market. These include frozen omelets, frozen egg sandwiches, instant dry egg nog, pickled eggs, junior baby foods, aerosol egg foam, egg chiffon pie, "Warm 'N Serve" chicken, and many others.

With the tremendous increase in population, poultry meat and eggs will enter into the population's diet to an even greater extent in the future.

Do you know we've had news censorship ever since Adam and Eve? Or do you really believe Eve tempted Adam with an apple?

"Do you know why traffic lights turn red?"

"No, why do they?"

"You'd turn red, too, if you had to stop and go in the middle of the street."

A kiss is a mouthful of nothing that tastes like heaven and sounds like a cow pulling her foot out of deep mud.

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SOUTH CAROLINA
ELECTRIC CO-OPERATIVE
ASSOCIATION, INC.

AGRICULTURE

(Continued From Page 4)

During the latter part of the 19th century, agrarian discontent gave rise to the movement to dispel corruption from our government. During this so called "Progressive Era," which extended to the first World War, several movements born on the farm were incorporated into legislation. Some of the most notable of these movements were the direct election of United States senators, a national income tax, a tariff revision, and programs aimed at the conservation of our natural resources.

This brief glance at the past is given to show that the farmer has been instrumental in the building of the great America we know today. Agriculture's past record is one of progress and satisfaction, but today the farmer is faced with a new and more challenging situation than ever before. The farm population today makes up less than 8 percent of our total population, and experts are predicting that our population will reach 225 million by 1975. With the agricultural population continuing to decrease it will take a renewed and vigorous effort on the part of everyone connected with agriculture to furnish these future Americans with the food, clothing, and other agricultural products that will be demanded.

Agricultural research must continue to explore and investigate ways of making production and marketing even more efficient; not only will a large quantity of agricultural products be needed, but the quality of these products must conform with our ever increasing level of living.

The American farmer, a manager of a complete business, must strive to improve his ability as an entrepreneur. He must always be conscious of new techniques that are being developed and of the changes that are taking place around him. His farming program should be flexible to allow him to make changes and adjustments with a minimum of expense and time.

The farmer must realize that he is dealing in a world of specialization and big business, and he must seek ways to deal on favorable terms with these operations. The farmer of tomorrow will have to know how and when to use credit. He will have to know when to specialize and when to diversify his farming operation in order to operate as efficiently as possible.

The shifting of the population from rural areas to urban areas, and, subsequently, the Supreme Court ruling in **Baker versus Carr,** which decreed that states would have to realign their political districts so that rural and urban representation in government would be equal, has put the farmer in a new political situation. Agricultural voices in our state and national governments will be fewer in the future. Some of the key positions now maintained by leaders of agricultural interests probably will be manned by urbanites in the near future. If the farmer is to maintain a strong voice in our future political decisions, then farm leaders will have to be clear and concise in the analysis of rural problems, conscious of developments in both rural and urban areas, and continuously searching for ways to strengthen the farmers' economic position and, simultaneously, the economic position of our economy as a whole.

The future probably will place even more and tougher obstacles in the farmers' path, but if the past is any indication, and I think that it is, the farmer will find some way to dissolve the obstacles and continue to do his part in building America.

Whither Now?

"The average age of the world's great civilizations has been 200 years. These nations progressed through this sequence:

From Bondage to Spiritual Freedom
From Spiritual Freedom to great Courage
From Courage to Liberty
From Liberty to Abundance
From Abundance to Selfishness
From Selfishness to Complacency
From Complacency to Apathy
From Apathy to Dependency
From Dependency back again into Bondage

In thirteen years our United States will be 200 years old. Can you define our status today? Where will you be tomorrow?"

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Agronomy Club News

The Clemson Agronomy Club has kicked off the new year with the usual election of officers. They are: President—Tommy Cordray, Allendale; Vice-President — Jimmy Vaigneur, Ridgeland; Recording Secretary — Tommy Hardaway, Dillon; Treasurer—David Ledbetter, Williamston; Corresponding Secretary—George Bryan, Allendale.

Dr. M. B. Boling has been chosen by the club to be our new Junior Advisor, serving with Dr. C. E. Bardsley, who moved to Senior Advisor.

A full slate of activities has been planned including work projects for raising money as well as entertainment for the club. Activities include an Exchange Day with the University of Georgia Agronomy Club, at which time the Clemson Club will visit the Georgia campus with the purpose of exchanging ideas and information concerning club activities.

The Clemson Club is planning to visit a copper mine in Tennessee which will be both entertaining and informative.

Our annual Awards Day Banquet will be given in honor of the graduating seniors. This will consist of a steak supper at which the club members will bring guests, and at this time scholarships and awards will be presented to outstanding agronomy students.

We are looking forward to a most successful year with our increased membership and full participation in our activities by all of our members.

GEORGE E. BRYAN, JR.

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WHEAT

Coker 61-19
Coker Hodden

COKER'S PEDIGREED SEED
BLOOD WILL TELL

THE RUMEN

(Continued From Page 12)

These organisms in themselves have three main duties.

The first function of the organisms is to secrete enzymes which soften and disintegrate rough feeds and bread down to starches and cellulose. This action of the organisms on cellulose produces organic acids, the final aim in digestion when the material is not too mature having a high lignin content. These organic acids, mainly acidic, propionic, and butyric are absorbed through the rumen wall directly into the blood stream.

Secondly, the organisms build complete proteins. The bacteria and yeast may thrive on non-protein, nitrogen-containing substances. Thus, they build protein from non-protein substances, and when they die they are digested by the cow as a source of protein. Since much of the dietary protein is broken down, assimilated, and resynthesized into bacterial protein, it is not necessary to provide the same quality of protein as is necessary for monogastrics.

The third function of the rumen organisms is to produce various B-complex vitamins. The dairy cow need not be fed these B-complex vitamins as such since the organisms in the rumen can manufacture them. In the digestive system of the cow, she is able to absorb the vitamins from the bacteria into her blood stream which are then available for body processess or for inclusion in the milk.

In the fermentation process, large amounts of gases are produced. If the cow is not able to pass off the gases by the reflex action belching, bloating occurs.

Thus, we can see since that portions of the feed are digested and the remaining feed is prepared for further digestion in the rumen. Hence, any way that we might aid the rumen by feeding correct feeds, we can speed up the work of the rumen and have healthier cows with a higher ratio of feed conversion to milk. This, then, logically gives us the reason for large warranted amounts of rumen research being carried on.

Modern art: A scared Guernsey cow backed up against a canvass.

The Backbone Of Agriculture

JIMMY WIGGINS, Agricultural Engineering, '66

Mechanization of agriculture has had two main objectives throughout time: 1) to increase the productivity per worker, 2) to change the character of farm work, making it less arduous and more attractive.

As a power unit, man physically is very ineffective and inefficient. He is capable of approximately 0.1 hp. of continuous output.

Because of man's ineffectiveness and inefficiency agricultural engineers have been faced with the problem of substituting machines for men. Some might argue that this mechanization has been part of the cause for widespread unemployment in the United States today. But, without these modern methods which have replaced many field workers one man would still be producing only enough food to support 4½ people as he did 100 years ago. Today, thanks to modern machines, implements, and fuels, one man can produce on the average enough for approximately 25 people.

The word **tractor** has been attributed to various sources, but according to the Oxford Dictionary the word was used in 1856 in Great Britain as a synonym for **traction engine.** The term **tractor** appears in an 1890 U .S. patent for a track-laying steam traction engine.

The early steam engines were stationary engines which produced only belt power and had to be moved from place to place behind mules or oxen. Obviously the next step was to convert the stationary engines into self-propelled ones. Successful steam plows were developed in the decade of the 1850's and continuous development occurred during the next 50 years.

The first tractors were plagued with many problems, but one of the foremost concerned traction. Attempts to solve this problem failed when inventors tried making the wheels and wheel base extremely large. One big-wheeled tractor in 1900 had two wood covered drive wheels, each 15 ft. wide and 9 ft. in diameter. The whole rig weighed 41 tons.

The need to reduce the number of men required to operate a steam engine stimulated early attempts to develop a gasoline engine. As farms grew larger so did gasoline engines. The tractors grew also. In 1925, there were only 549,000 tractors in the U. S. In 1961, there were 4,720,000.

While early engine designers had to compromise on designs to permit operation on distillate or gasoline fuels, today's designers can concentrate on securing the most efficient engine design specifically for one of three commercially available fuels — gasoline, diesel fuel, or liquid petroleum gas (LPG). The durability and versatility of modern tractor engines has been influenced by such factors as: design and placement of air cleaners, improvements in combustion chambers design, widespread use of exhaust valve rotators, chrome plated piston rings, improved cylinder blocks, valves, and bearings. The quality of modern gasoline has also had a marked effect on the improvement of engines and their designs. Gasoline antiknock properties have been increased thus increasing the total performance of gasoline engines.

In the last several years the compression ratios of tractors have increased with an increase in horsepower and rpm's. The reason for tractor engine compression ratios being less than automobile compression ratios is that a typical passenger car will product its maximum horsepower at about 4600 rpm's, and with automatic transmission cannot operate at full load at speeds much lower than 1600 rpm's. On the other hand, a typical gasoline tractor engine is governed at some top speed (e.g., 2000 rpm), and often operates at full load at lower speeds. Since the octane number reuirements usually are highest during full-throttle operations at low speeds—a condition that is eliminated in most passenger cars—the compression ratios of tractor engines are somewhat lower than the compression ratios in automobiles designed to operate on the same type gasoline. The performance of a gasoline engine is largely dependent on the antiknock quality of the fuel used in it—and how effectively the engine utilizes this quality. Gasoline tractors are usually designed to operate on the average regular grade gasoline available at that time. An advance in the ignition timing of four degrees increases the antiknock quality by approximately six numbers.

Gasoline antiknock quality is given as a whole number between 0 and 100. The number is actually the percentage of two test fuels combined to proudce the same knock as the fuel being tested. Two fuels determine the octane scale, heptane which has a value of zero and iso-octane which has a value of 100 octane numbers. The test is made with a special engine developed by the Cooperative Fuel Research Committee. The octane number of the fuel being tested is the percentage of iso-octane in the mixture of the two fuels that has the same knock intensity as the fuel being tested. High octane rating is necessary for high compression, high performance engines.

The ignition quality of diesel fuel is determined by a method similar to that used in determining the antiknock quality of gasoline. s in the case of the octane number scale, the scale of cetane number for diesel fuels represents blends of two pure hydrocarbon reference fuels. Cetane is a hydrocarbon with very high ignition quality, and was chosen to represent the top of the scale with a cetane number of 100.

Liquefied petroleum gas is commonly known to the trade as LPgas. It consists of propane and/or butane along with small amounts of other hydrocarbons. The boiling points of the various LP fuels range from -127°F. Due to these low boiling points these fuels must be handled in closed pressurized containers. When LP gas is used in an engine, pressure reduces and vaporizers are substituted for normal carburetion

(Continued On Page 20)

THE BACKBONE

(Continued From Page 19)

equipment before the fuel reaches the carburetor.

A comparison of the physical properties of these three tractor fuels is given in the table below.

It is not surprising that numerous fallacies concerning fuels and engines have become accepted by many people as facts. A few of the more common ones are listed below.

fallacy: High-octane gasoline will raise the operating temperatures of engine parts, therefore tending to cause the engine to "burn up."

fact: Modern gasoline of both regular and premium grades have practically identical heating values, approximately 115,000 BTU/gal.

fallacy: High-octane gasolines are more dangerous than lower octane fuels.

fact: The ignition tendencies of a gasoline have no direct relation to its octane number.

fallacy: "High test" and "high octane" mean the same thing.

fact: "High octane" means that gasoline has a high resistance to knocking when burned in the combustion chamber of an engine. On the other hand, "high test" refers to the volatility or distillation characteristics of a gasoline.

fallacy: Only premium-grade gasolines contain tetraethyllead for octane-number improvement.

fact: Today, over 99 per cent of all motor fuels sold in this country contain tetraethyllead.

These fuels given above have served us well in the past and will probably continue to provide us with much farm power in the future. But what other advancements are in store for fuels of tomorrow? Will tomorrow's tractor power come from solar energy, nuclear reactors or fuel cells? The field of potential farm energy is a wide open one and the surface has only been scratched.

Fuel	API Gravity Deg.	Weight lb/gal	High Heating Value BTU/gal	Cost Cents/gal	Octane Number	Nominal Comp Ratio	Air/Fuel Ratio
Butane	114	4.80	102,000		98	8.0:1	15.5:1
Premium gasoline	63	6.06	123,000	22.5	99	8.0:1	14.7:1
Regular gasoline	61	6.12	124,000	18.5	93	7.4:1	14.7:1
Diesel	40	6.87	135,000	16	*40	16.6:1	

* Cetane number

College is a four year loaf made from the flavor of youth, and the old man's dough.

And then there was the tugboat that committed suicide when it found out that his mother was a tramp and its father was a ferry.

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Activities From A To Z

Recently the South Carolina Chapter of Alpha Zeta initiated 18 new members. Academic excellence along with leadership and character are the primary requirements.

Alpha Zeta made an attempt at the start of second semester to organize a book exchange. While the volume handled was not large, the idea appears promising and will be continued next year.

Plans for the annual spring student-faculty initiation banquet are well under way. Mr. William L. Harrelson, South Carolina Commissioner of Agriculture will be the invited speaker.

After two years of traveling the South Carolina Chapter was host to the Third Southeastern Regional Conclave March 26-27. Representatives from five of the seven chapters in the Region met for discussion and work. The S. C. Chapter (located at Clemson) was voted the outstanding chapter in the region for the third year in a row.

Plans are underway for a Freshman Picnic sponsored by AZ to acquaint all freshmen in the College of Agriculture and Biological Sciences with the aims and activities of the Fraternity of Alpha Zeta.

The Hort Club Sweetheart, Miss Olis Brooks from Loris, Clemson's 1964 Miss Homecoming, received the title of Miss Rural Electrification at the annual beauty contest in Miami, Florida, on January 27. Olis also received two scholarships totaling $2500.

We of the Hort Club are looking forward to a fruitful and flowering school year in 1965-66, and we anticipate many new members in the upcoming freshman class to expand our club.

TED STEPHENS

Hort Club News

The dates of January 21-February 4, 1965, marked the Eleventh Annual Meeting of the American Society for Horticultural Sciences Collegiate Branches. Those representing the Clemson University Horticulture Club were Dr. Gene E. Stembridge, Mr. J. P. Fulmer, Butch Ferree, Thomas Woodham, and Jennings Gainey. Thomas Woodham presented a paper on the Development of the Ornamental Research Area Landscaping Project, which is in progress here at Clemson, in competition for the J. B. Edmond Award. Tuesday night, February 3, at the annual banquet, Mary Delchamps from Auburn University was presented the J. B. Edmond Award for her paper on the Causal Agent in Leaf Spot Liriope.

On March 2, the Hort Club meeting was held and officers for the 1965-1966 school year were elected and took office on this date. Those elected were: President, Jennings Gainey; Vice President, Loren Brown; Secretary, Louise Carroll; Treasurer, Arthur Pfister; and Club Reporter, Ted Stephens. Dr. R. R. Rothenberger was chosen by the members to be the faculty advisor for the following school year. Robert Culp was appointed by the president as editor of the **Collegiate Horticultural Newsletter.**

On the club's calendar for the remainder of the semester will be a "juice session" for making grape juice to sell in the Agricultural Sales. The annual banquet has been tentatively set for April 27 at The Southerner with guest speaker Mr. T. C. Cummings of the Ti- Ti Peat Humus Company.

COBURG

BETTER THAN
IT HAS TO BE !

DAN'S
SANDWICH SHOP
Clemson, S. C.

"Let Us Cater
Your Entertainments"

The Birth Of Alpha Gamma

During the spring of last year began the metamorphosis of a new social fraternity on the Clemson University campus. Danny Bozard, Gene Dukes, Sidney Farmer, Bobby Lanford, Gene Merritt and Jimmy Williams discussed the fact that there are only two national social fraternities which take their membership primarily from agricultural students. These fraternities, Alpha Gamma Rho and Farmhouse, were contacted and asked for specific information about their respective organizations.

These students again met and discussed the idea of the new organization when school reopened in September of 1964. Information from national organizations had been acquired during the previous summer and several alumni from each were contacted at Clemson. After thoroughly discussing this information it was finally decided that the fraternal organization would be patterned similar to Alpha Gamma Rho in the hopes that some day the Clemson fraternity may be allowed to affiliate with the national organization.

Officers for the new fraternity for the year 1964-65 were as follows: Jimmy Williams, President; Danny Bozard, Vice President; Dr. D. V. Chalupa, Dr. M. A. Boone, and Dr. W. C. Mickleberry were selected as faculty advisors. These three faculty members had all been members of the AGR chapter during their own college careers.

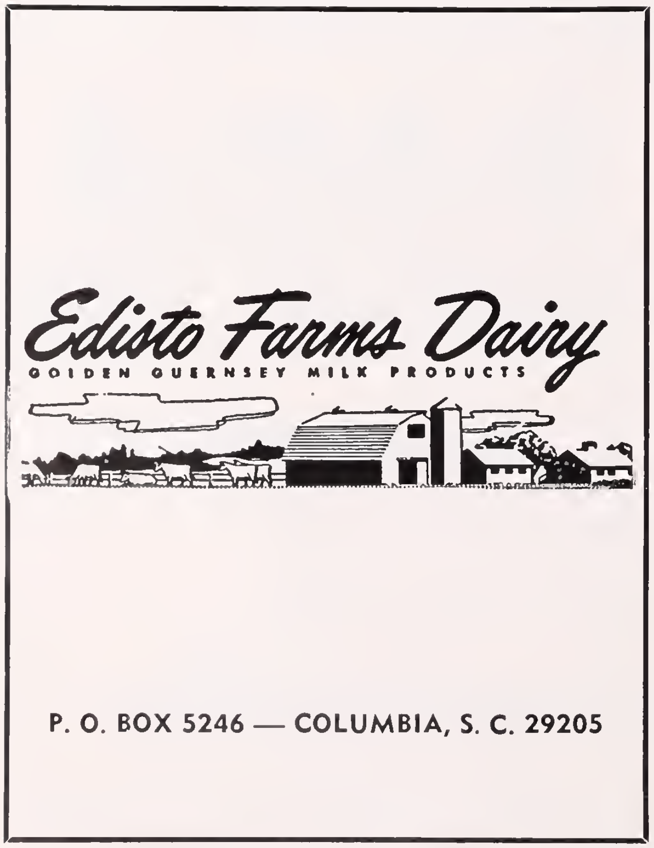
A constitution was drawn up and submitted to the Office of Student Affairs, where it was approved by the school administration. The constitution and petition for admission as an associate member was then submitted to the Clemson University Inter-Fraternity Council. On April 27, 1965 the Inter-Fraternity Council unanimously approved the application, and the Alpha Gamma Fraternity became a reality.

Wasting no time the group held a smoker for interested students who wished to become members, and this was attended by twenty-eight students.

After the original six students and the three faculty advisors had met several times, twenty-six students were selected as members, two of whom were in the original six and do not graduate from Clemson this year.

Plans are now being made for the fraternity members to move into the eighth dorm when the fall semester of next year begins.

The establishment of the Alpha Gamma Fraternity on the Clemson campus is a giant step forward for all concerned and it is our hope that the inter-fraternity system will be strengthened. This organization will give each of its members a more meaningful college life and will contribute greatly to the overall education of the individual.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This, our first advertisement, was published in 1936. With Divine guidance, and continued research in Colleges of Agriculture, we have had reasonable success in our 29 years of operation. Why do we enjoy working with agricultural students and young colts? Because, "Nothing keeps you young like the *young!*"

SHADOWS AND TRUMPETS

*"A business is but the lengthened shadow of
the man directing it."*

That being true, you will form an opinion of us in the manner in which we manufacture SUNI-CITRUS PULP—its quality, the service we give you.

Also you will judge us by the manner in which we solicit your business.

The flare of trumpets is the signal for the beginning of the opening parade at every circus performance. Some companies open with this type of sensational advertising. There hasn't been any blowing of trumpets about our company and about what we are going to do. There won't be.

We will tell you facts about SUNI-CITRUS PULP. We are trying to manufacture it so that it will be the *best* citrus feed.

During the coming season, we ask your cooperation in helping the Florida Citrus Feed Industry develop in a sound, fundamental, businesslike manner.

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Our family has been growing citrus in Florida continuously since 1908

Thanks, Shelby . . .

The AGRARIAN staff wishes to thank Miss Shelby Jean Walker of the Agronomy and Soils Department who has so faithfully served us as secretary. In the midst of all her other duties, she has found time to type our letters and to render other services. We sincerely thank you, Shelby!

FOREST FERTILIZATION

(Continued From Page 7)

and this is taken into account to insure the proper mixture used.

There are numerous problems that need to be solved in this comparatively new field of forest fertilization before practical recommendations can be made. Among the factors to be considered are the amount and type of fertilizer, the age and species of the tree, the method of application, and the kind of soil. Another problem is the introduction of diseases along with the increased use of nutrients. Southern pines especially, are known to be more susceptible to fusiform rust infection after they are fertilized. The use of fertilizers on poorly drained sites may prove to be beneficial. Many trees are unable to grow satisfactorily in flooded areas where drainage is poor and it is believed that the addition of nutrients before and during flooding may stimulate growth. This would eliminate the need for drainage in such areas. In dry areas it has been found that supplementing soils with nitrogen and phosphorous gives a greater degree of drought hardiness.

Block And Bridle Club News

The Clemson University Block and Bridle Club is active again, with the initiation of new members highlighting the first part of the Spring Semester. The new members began their initiation procedures on February 25, 1965, and were formally initiated into the club on March 2, 1965, following a club cook-out at the Food Industries Building.

On April 10th, the club will sponsor a live animal evaluation contest for members of the club. There will be awards given to the winners in both contests.

The annual banquet is planned for April 23rd at the Food Industries Building. Immediately following the meal, there will be a guest speaker to address the club.

The Block and Bridle Club will end this very successful year with the spring barbecue at the intra-squad football game. The date for this annual event is May 1, 1965. All students and faculty are invited to attend. Tickets will be on sale at the Little Gym.

JACK CHANDLER

CREEP-FEEDING

(Continued From Page 6)

ond calves. In light of these results it might be profitable to creep-feed calves from first calf heifers.

In conclusion, it appears that the creep-feeding of beef calves is not a profitable practice for the commercial producer.

A bachelor is a college graduate who didn't have a car during his college years.

Investigation into these and other problems will eventually give answers to the questions that forest managers have been asking concerning the practical use of fertilizers in forestry operations.

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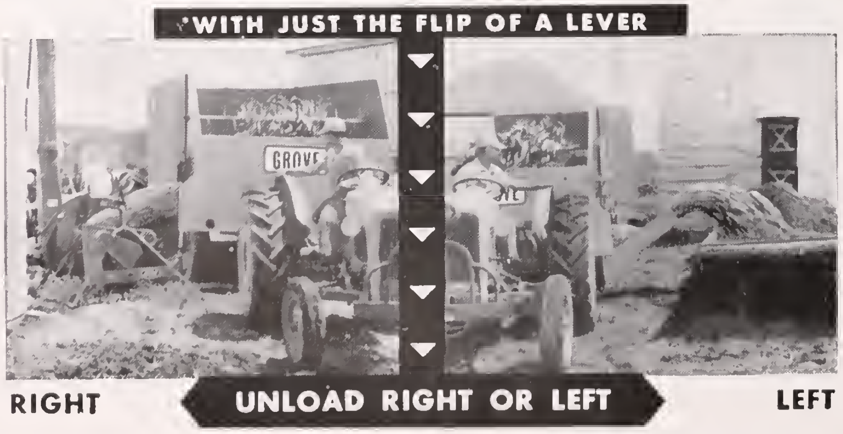

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every worthwhile institution
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